FLASHES AND PLUGS

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She says that's the same number—Exp. 6-30-55—that is on all Los Angeles dog licenses. The number means the date the tag expires.

"I get calls from all over Los Angeles from people who want to report that they've found my lost dog. We have no dogs."

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CIRCULATION

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Telephony

THE JOURNAL OF THE TELEPHONE INDUSTRY

September 25, 1954

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608 S. Dearborn St., Chicago (5), Ill., U. S. A.
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"Come all ye faithful"

By FRANCIS X. WELCH

There is a loud clear bell ringing for every Independent telephone industry man and woman in the United States. It is calling: "Come all ye faithful." It is a summons to the annual convention of the United States Independent Telephone Association in Chicago on Oct. 11, 12 and 13.

EARLY in this month of September the adult population in this country of ours heard a familiar nostalgic sound. It was the ringing of school bells all over the country, calling all the little geniuses and imps, all the angels and monsters, back to their classrooms. No matter how many years have passed since we first felt ourselves free to ignore that summons—whether in the lower grades or on the college campus—it never fails to bring back to most of us memories of more carefree days.

It probably also brings back, to some of us, the memory of lost opportunities, of lessons unlearned and of knowledge neglected. No matter how smart and successful we may consider ourselves, there is often the haunting thought that we could have done a little more, a little better—and maybe it would have paid off for us in the workaday years that followed.

Fortunately for all of us, learning need not stop in the classroom. The opportunities for increasing our knowledge and satisfaction in our job remains available in a number of ways, just about as long as we stay in business. *The important thing is to hear the bell ringing and to recognize that it is ringing for us, not somebody else.*

It may be only a symbolical bell, an invitation to this, or an announcement of that. But the lucky man who recognizes his bell, when he hears it ringing, is likely to be blessed in a number of ways, not merely in the art of getting along better with his job.

For men and women in the Independent telephone industry one of the most important bells of this sort—one which is heard every year—is rung in October, not September. It is the annual summons to the Chicago metropolis to attend the annual convention of the United States Independent Telephone Association. As in the past it will be held at the Hotel Conrad Hilton (neé Stevens). As in the past, non-members will be welcomed to the sessions if they are seriously interested in the Independent telephone business. As in the past there will be a balanced program of food for thought and social entertainment.

But there are special reasons why the alert telephone man or woman will not want to miss this summons to Chicago, in this year of 1954. There are important matters stirring in the Independent telephone industry. There are serious and critical matters which he or she will want to hear discussed and analyzed by experts. Added to this will be the opportunity, available nowhere else and in no other way, to kick these problems around personally — to ask our own questions and get some smart answers to a lot of things about the business which have been bothering us.

It is an open invitation to make personal contact with the best brains, the most skillful technicians and specialists in the industry, in addition to distinguished speakers from outside the industry. It is a chance to get down to brass-tack discussions and open forum conferences on developments in all the particular branches of the industry—accounting, commercial, traffic, and plant. It is an opportunity to renew old friendships and make new and valuable acquaintances in the numerous informal social parties, as well as in the programmed entertainment sessions. All this, for the price of a round trip to Chicago (unless you are a native) and a three-day stay at a hotel! A better bargain doesn't happen all year around.

What are some of these Independent industry problems which are especially

critical this year? Well, take the new federal tax bill, for example. Is there a telephone front office man in the country who has not wondered and puzzled over the new rules covering deduction from income for plant depreciation, savings on consolidated return, where the privilege is available, and when to figure on the books the lower corporate rate which is supposed to go into effect automatically next year? How will the new pay-as-you-go provisions affect your company? The Accounting Conference has made arrangements for full and complete discussing of all the brain twisters which have been hatched out by the new federal law.

And there is always important news of congressional legislation and federal policies. What's the outlook on REA loans? What's the latest on cooperative and other telephone company acquisitions at the small company level? This is a subject which is hotter this year than at any time since the days of the Kingsbury Commitment, nearly three decades ago. There will be competent USITA reports and commentary about all the news coming out of Washington, both congressional and administrative.

In addition, a speaker of national prominence is going to give an inspiring and thought-provoking analysis of the status of American freedom today, and about the stake of the American businessman in it. You will long remember the words of this widely syndicated commentator and will be proud of the chance to go back home and tell the folks there you heard him in person at the USITA convention.

Another nationally-known authority on public relations techniques has been secured to give our Independent telephone people some practical down-to-earth advice on gaining and maintaining the friendship and good-will of the subscribing public. This is an important item in these days of rate case and service complications.

Also, along this line there will be special discussion and explanation of the new USITA nationwide advertising campaign and what it is doing to make the Independent telephone industry better liked and understood.

And, speaking of rate cases, and service complications, where else would there be found gathered together, in one place at the same time, so many telephone people who have been through the mill of rate case procedure. In these days when many companies have had to go back to their regulatory commissions for second, third, and fourth helpings on rate increase applications, so much can be gained by talking with those who have had actual experience.

Then, there is the thorny question of re-establishing sales effort. Many telephone people are sitting around right now, confronted with the problem of what to do about boosting customer revenue—now that the postwar demand has begun to slacken and the "held order" list has all but disappeared in many places. It is easy enough to say that the telephone sales people have got to get up out of the seats of their comfortable chairs and start selling service as in the good old days. There are a lot of "dont's" and "bewares," a lot of pitfalls and booby traps waiting for the small company sales official who tries to start from scratch and expects early results from a green sales organization.

There will be plenty of "know how" on tap in Chicago for the conventioneers to consult. It would be quite possible, in fact quite likely, that everyone in attendance interested in this subject could go away from Chicago with a baker's dozen of ideas about realistic sales techniques, about the establishment and training of a sales organization and about keeping production overhead in balance with results produced. If one were to leave Chicago with just one sound and sane idea, which could be put to effective use, the payoff could easily yield, in additional revenues, many many times the price of the round trip to Chicago, with all the trimmings and no holds barred.

For programmed entertainment, of course, there is that traditional get-together for the old-timers and those not so old—the annual luncheon, an annual meeting of the Independent Telephone Pioneer Association. A famous university glee club has been scheduled to sing at this session. And anyone who has attended the USITA convention banquets knows what to expect in the way of fine food, frolicsome atmosphere and talented floor show.

The Independent industry's manufacturers and equipment concerns will be on hand to demonstrate many new features this year, in the way of up-to-the-minute products of all kinds—for inside and outside plant. Automatic devices, office machines, microfilming of toll tickets, time-saving, money-saving, and life-saving tools and plant facilities—all will be exhibited in bigger-than-ever displays. Here again, the value of just one idea alone, which the telephone man who attends the Chicago meeting may take away with him, can result in a money payoff worth thousands of times the modest cost and time expended in making the trip.

The temptation exists, as in former years, to put off the trip "just this one year" because of the pressure of business. To yield to that temptation would be to ignore the bell ringing, a clear loud telephone bell which summons one and all to the USITA meeting. Yielding to such a temptation can easily become an elusive habit. The same pressure of business, which is the excuse this year, would surely become, in mind at least, an even stronger excuse next year. And so, the valuable contacts would soon fall into disuse, the opportunities would become lost, and the bemused telephone man would find himself a few years hence working harder than ever, but with less satisfaction and understanding of his job, and a loss of the pleasure he used to get out of it. He might even get that same little guilty feeling every time he heard a school bell ring.

To keep the contacts bright, to cash in on the opportunities, and gain all the benefits, there is only one way to do it. You can't do it by proxy. You can't send someone else and expect to get a full return. You just can't "read all about it" in TELEPHONY's "Convention Report Issue" (Oct. 23), as valuable and as comprehensive as that coverage will be, as always. After all, there is no real substitute for personal attendance. So, listen to the USITA bell ringing and answer it. Its message is perfectly clear: "Come all ye faithful!" It is ringing for you to come to Chicago, Oct. 11 to 13 inclusive, to attend the annual convention of the USITA. You will never regret it.

USITA ARRANGES ADVANCE REGISTRATION

In order to minimize congestion at the convention registration desk, USITA is providing for advance registration. To do this it will be necessary for each company to let USITA know whom it will send to the convention and by whom they will be accompanied. Send your list to Clyde S. Bailey, executive vice president of USITA, Suite 438 Pennsylvania Bldg., Washington 4, D. C., promptly.

The Association will prepare registration cards and name plates for badges in its Washington office. When you register for the convention, you may go to the proper alphabetical section of the registration desk in the North Assembly Room, Conrad Hilton Hotel, and ask for your badge.

Program for 57th Annual Convention

United States Independent Telephone Association

CONRAD HILTON HOTEL, CHICAGO

MONDAY, OCTOBER 11

9 A.M.—REGISTRATION—North Assembly Room (Third Floor).

10 A.M.—PLANT CONFERENCE—North Ballroom. DANIEL S. SEITZ, *Presiding.* GREETINGS FROM THE USITA, WARREN B. CLAY, President; REPORT OF PLANT COMMITTEE, DANIEL S. SEITZ, Chairman; PLASTIC CABLE INSTALLATION AND MAINTENANCE, P. M. FERGUSON, JR.; REPORT OF RADIO SERVICE COMMITTEE, C. H. MCLEAN.

1:30 P.M.—LIAISON WITH PRIVATE COMMUNICATION SYSTEMS, PETER A. NENZEL; MY FIRST DIAL CONVERSION, D. E. MCGREGOR; PERSONNEL TRAINING, G. E. KRIEGER; IS YOUR SAFETY PROGRAM ADEQUATE?, ERLE S. MINER, American Telephone & Telegraph Co.

10 A.M.—COMMERCIAL CONFERENCE—Lower Tower Room. KENNETH L. LAWSON, *Presiding.* GREETINGS FROM THE USITA, DONALD H. CAMPBELL, vice president; REPORT OF COMMERCIAL COMMITTEE, KENNETH L. LAWSON, Chairman; THE POWER OF ADVERTISING AND WHAT IT CAN DO FOR YOU, J. M. MATHES, J. M. Mathes, Inc., New York, N. Y.; NEW FRONTIERS IN HUMAN RELATIONS, ROBERT E. SCHWAB, Detroit Edison Company, Detroit, Mich.; THE EMPHASIS SHIFTS TO SELLING, LESLIE H. WARNER.

10 A.M.—TRAFFIC CONFERENCE—South Ballroom. GEORGE W. ROSE, *Presiding.* GREETINGS FROM THE USITA, WARREN B. CLAY, President; REPORT OF TRAFFIC COMMITTEE, GEORGE W. ROSE, Chairman; RESPONSIBILITY ACCOUNTING IN THE TRAFFIC DEPARTMENT, D. A. PERRIGO; MOTIVATING MANPOWER, WALTER F. ROBERTS; THE CHIEF OPERATOR IN HER EVERYDAY JOB, MISS LYDIA MIELKE; A RECIPE FOR GREATER SERVICE, HERMAN J. KLEINHAMMER.

10 A.M.—ACCOUNTING CONFERENCE—Upper Tower Room. O. M. WESTRUP, *Presiding.* GREETINGS FROM THE USITA, CARL D. BROREIN, Treasurer; REPORT OF ACCOUNTING COMMITTEE, O. M. WESTRUP, Chairman; SALIENT PROVISIONS OF THE 1954 INTERNAL REVENUE CODE AND THEIR IMPACT ON OPERATING TELEPHONE COMPANIES, H. N. SHARROW; EMPLOYE RELATIONS—ASSET OR LIABILITY?, R. P. SULLIVAN; THE EFFECT OF PRICE LEVEL ON DEPRECIATION, LEONARD SPACEK, Arthur Andersen & Co., Chicago.

TUESDAY, OCTOBER 12

10 A.M.—GENERAL SESSION—Grand Ballroom. INDEPENDENT TELEPHONY IS ON THE MARCH, WARREN B. CLAY, USITA President; ASSOCIATION ACTIVITY HIGHLIGHTS, CLYDE S. BAILEY, USITA Executive Vice President; REPORT OF THE TREASURER, CARL D. BROREIN; ADDRESS BY SPEAKER TO BE SELECTED.

2 P.M.—INDEPENDENT TELEPHONE PIONEER ASSOCIATION—Grand Ballroom. FRANK S. BARNES, ITPA President, *Presiding.* BUSINESS SESSION; ENTERTAINMENT — University of Notre Dame Glee Club.

WEDNESDAY, OCTOBER 13

10 A.M.—GENERAL SESSION—Williford Ballroom. ELECTION OF DIRECTORS; REPORT FROM THE SECRETARY'S OFFICE, GEORGE C. RICHERT; CAN WE AFFORD TO BE FREE?, RAYMOND MOLEY, Contributing Editor, *Newsweek;* TELLING THE BUSINESS STORY, HAROLD BRAYMAN, Director, Public Relations Department, E. I. du Pont de Nemours & Co.

Pioneers to Hear Notre Dame Glee Club

THE INDEPENDENT Telephone Pioneer Association is rapidly becoming recognized as the organization that brings good music to the Independent telephone industry through its sponsorship of leading musical groups at its annual meeting, held during the conventions of the United States Independent Telephone Association in Chicago.

Among organizations appearing before the Pioneers in the past are the Purdue Varsity Glee Club (three times) and the Northerners, popular radio and television male singing group sponsored by the Northern Trust Co. of Chicago.

This year, on Oct. 12 during the USITA convention, the Pioneers will be entertained by the Notre Dame Glee Club (pictured above).

The Pioneer concert will be another milestone in the colorful 39-year history of the Notre Dame student choral group. Organized as a 12-voice chorus in 1915, the group has grown to 40 voices. Under the direction of Prof. Daniel H. Pedtke, head of the department of music at the university, the Notre Dame choraliers have toured the country twice yearly, averaging 8,000 to 10,000 miles annually. In 1953, the glee club entertained more than 125,000 listeners receiving plaudits for its genuine choral merit.

Today, the glee club is one of the best known, loved and enjoyed organizations in the country. In addition to tours and concerts, the Notre Dame singers have performed on the network facilities of NBC and CBS, made six consecutive appearances on Ed Sullivan's TV "Talk of the Town" show, and recorded some of the most popular songs in their extensive and varied repertoire.

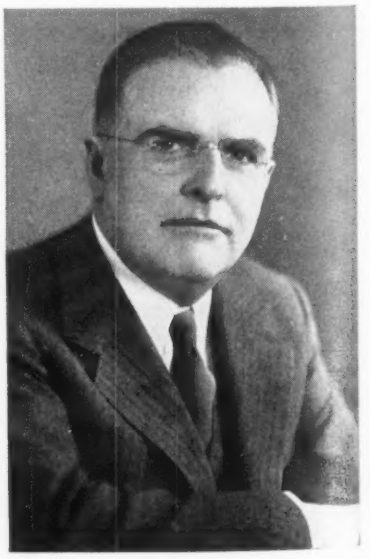
A distinguished career in vocal and instrumental music stands behind Professor Pedtke, director of the glee club.

A pupil of such musicians as Alexander Raab and Sergei Tarnowsky, Professor Pedtke made his debut as a pianist at 15 and a year later was giving organ recitals. At an early age Professor Pedtke also appeared as soloist with the Chicago Symphony Orchestra. Before coming to Notre Dame in 1939 he also received a degree in music from DePaul University of Chicago and studied at the Bush and American conservatories of music.

As an organist for theaters of the silent movie era and as an accompanist on radio station WGN in Chicago, Pro-

F. S. BARNES
ITPA President

RAY DALTON
ITPA Vice President



J. B. HALEY
ITPA Vice President

fessor Pedtke widened his musical experience, and by examination received the highest ranking honor of Fellow in the American Guild of Organists, an organization whose membership is so rigorously regulated that many accomplished musicians strive for years to attain admittance without ever achieving the necessary degree of technical perfection.

Since that time the Notre Dame musician has served as organist and choir master for numerous churches in the midwest and for a time was head of the music department of the College of St. Theresa, Winona, Minn.

Professor Pedtke is a composer and author as well as a conductor; he has composed several works for piano and organ.

All members of the Independent Telephone Pioneer Association and all persons attending the USITA convention in Chicago, Oct. 11, 12 and 13, are cordially invited to attend the Pioneer meeting. The meeting will start promptly at 2 p.m. on Oct. 12 in the Grand Ballroom at the Conrad Hilton Hotel.

The Pioneer lounge—Room 535-A—at the Conrad Hilton, will be open to visitors on Oct. 10.

The Pioneer's Sixth Annual Hobby Show will be held in Room 536-A, adjacent to the Pioneer lounge. This popular show, conducted by the association's hobby committee, under the chairmanship of H. B. Couch of Topeka, Kan., features exhibits of hobbies of members of the Independent Telephone Pioneer Association.

Notice of intention to enter an exhibit should be sent to Mrs. Mayme Workman, executive secretary of the Independent Telephone Pioneer Association, P. O. Box 1179, Springfield, Ill. The notice should provide the following information: (1) Name and address of exhibitor; (2) nature of hobby, and (3) exhibit space required. Awards will be presented to the exhibitors having the most interesting, unusual, or attractive exhibits.

These two nationally-known figures will address the convention of the United States Independent Telephone Association. RAYMOND MOLEY (left) of New York City, contributing editor of *Newsweek* and author of a syndicated newspaper column, and HAROLD BRAYMAN of Wilmington, Del., director of public relations, E. I. DuPont de Nemours & Co.

MAYME WORKMAN
ITPA Executive Secretary

LEFT PHOTO: Shown attending the second annual picnic of the western area of Keystone State Chapter of the Independent Telephone Pioneer Association is the family of JOHN M. ROCKER, Yukon. The girl on the far right is a friend of Mr. Rocker's daughter. RIGHT PHOTO: Among the 200 pioneers present for the Conneaut Lake Park outing were PAUL L. COWAN (left), a director and past president of the Keystone State Chapter, and WILLIAM P. STRICKENBURG, Meadville, president.

Conferences Feature Convention

ONE OF THE most popular features of the program of annual conventions of the United States Independent Telephone Association is the division conferences — Accounting, Commercial, Plant and Traffic — sponsored by hard-working USITA committees.

Subjects discussed at these conferences center around problems and day-to-day operations in these four departments of a telephone company. In addition, they afford ample opportunity to those attending to present questions on any phase of accounting, commercial, plant and traffic, which are answered by members of the respective USITA committees or from the floor. Below are previews of the programs planned for the conference:

ACCOUNTING CONFERENCE

The Accounting Committee of the United States Independent Telephone Association will again provide the program for the Accounting Conference to be held in connection with the USITA annual convention in Chicago on Monday morning, Oct. 11.

In arranging the program the Accounting Committee undertook to include topics having a special significance at this time, as well as those which might be of general interest. Falling in this category, of course, is the Internal Revenue Code of 1954 which was approved and enacted into law on Aug. 16. Current revisions of the Internal Revenue laws are the most far-reaching in history. This subject will be discussed by H. N. Sharrow, vice president of Gary Services & Investment Co. Mr. Sharrow is eminently well qualified as a tax consultant and his presentation of this timely topic will be of interest to many.

An added feature on the program will be a talk on the subject of "Personnel Relations" by R. P. Sullivan, operating vice president of General Telephone Co. of the Southwest. Mr. Sullivan has made an intensive study of this important subject and his comments on personnel administration will be interesting as well as informative to those attending the conference.

Economic depreciation continues to be one of the really important matters affecting the financial health of operating telephone companies. It stems, of course, from the inflationary aspects of our economy. This we can expect to have with us for years to come. Leonard Spacek, managing partner of Arthur Andersen & Co., public accountants, who is an outstanding authority on the subject, will address the conference on this important topic.

Mr. Spacek is well known for the reports which he has prepared for use

O. M. WESTRUP
Accounting Committee Chairman

in rate-making by utility companies and regulatory commissions. He has also appeared before the Ways and Means Committee of the House of Representatives and presented statements in support of a change in the method of computing depreciation for tax purposes. In this connection, his proposals would likewise give effect to the changing level of prices.

In addition, the program will include a report by the Accounting Committee of its activities during the year. This report will be presented by the chairman of the committee, O. M. Westrup, vice president and comptroller of Illinois Consolidated Telephone Co., Mattoon, Ill.

* * *

COMMERCIAL CONFERENCE

THE USITA Commercial Committee chairman, K. L. Lawson, Lincoln, Neb., predicts the program for the Commercial Conference during the USITA convention will be one of the best ever presented.

One of the speakers will be James M. Mathes, president of James M. Mathes, Inc., New York advertising agency, who will address the conference on "The Power of Advertising and What It Will Do for You." Mr. Mathes' agency handles the current USITA national advertising program and serves an imposing list of nationally-known companies.

Another speaker will be Robert E. Schwab of Detroit, Mich., assistant manager - employe relations of the Detroit Edison Co.

Mr. Schwab has had a great deal of training in human relations work. His address will develop the theme of the importance of a good human relations program to any business. He will point

K. L. LAWSON
Commercial Committee Chairman

out the many ways in which a carefully organized and executed program will be profitable to management and to the employe group alike. Mr. Schwab is an author and has written a number of papers on the subject of human relations.

The third speaker on the Commercial Conference will be L. H. Warner of Chicago, president of Leich Electric Co. and Leich Sales Corp., who will discuss the subject, "The Emphasis Shifts to Selling."

Mr. Warner will stress the fact that for the first time since World War II, telephone companies are faced with the need for selling their services and that it is time for telephone company management to shift some of its attention from the raising of additional capital, expansion and modernization of plant

and related activities to meeting the problem of selling service.

Mr. Warner will point out the various types of services the telephone companies have to sell and will present his ideas on how an effective selling program should be organized and carried out.

* * * *

PLANT CONFERENCE

THE SUBJECTS to be covered at the Plant Conference at the annual USITA convention will touch upon many subjects of interest to all plant men. The conference will be under the sponsorship of the USITA Plant Committee and will be presided over by Daniel Seitz, chairman of the committee.

P. M. Ferguson Jr. of the Mankato (Minn.) Citizens Telephone Co. will speak on "Plastic Cable Installation and Maintenance."

A complete report on the activities of the USITA Radio Service Committee

DANIEL SEITZ
Plant Committee Chairman

will be rendered by Chairman C. H. McLean, of Associated Telephone Services, Inc., Chicago.

"Liaison with Private Communication systems" will be the subject discussed by Peter A. Nenzel of the California Water & Telephone Co., San Francisco, Cal.

D. E. McGregor of the Nebraska Central Telephone Co. of Gibbon, Neb., will speak on "My First Dial Conversion."

G. C. Krieger of the West Coast Telephone Co., Everett, Wash., will cover the subject, "Personnel Training."

"Is Your Safety Program Adequate?" is the title of an address which will be given by Erle S. Miner of the American Telephone & Telegraph Co., New York City.

ERLE S. MINER, safety engineer of American Telephone & Telegraph Co., who will speak on "Is Your Safety Program Adequate" at the Plant Conference during the USITA convention in October. He coordinates safety activities and practices for the Bell System. He has been a member of numerous committees of the National Safety Council and is past general chairman of the Public Utilities Section as well as a member of the American Society of Safety Engineers.

In an effort to be of greater service to plant men, as well as others attending the USITA convention, a few years ago an innovation was created when the Plant Committee assigned experts in different phases of plant work to attend a Plant Committee Room at the convention. This practice will be followed again this year and the Plant Committee Room will be 523 in the Conrad Hilton Hotel. Members of the Plant Committee will be assigned to the room and they will answer questions raised by convention delegates. If they do not have the answers to questions they will attempt to get them for the inquirers.

* * * *

TRAFFIC CONFERENCE

THE TRAFFIC COMMITTEE of the United States Independent Telephone Association has, it believes, lined up a most interesting and informative program for the USITA convention Traffic Conference to be held in the south ballroom of the Conrad Hilton Hotel in Chicago at 10 a.m. on Oct. 11.

Continuing a policy of long standing the committee has attempted to bring before its growing audience talented and experienced people from the Independent ranks speaking on topics that are currently being discussed among all traffic people.

Among this year's speakers are two members of the Traffic Committee, both relative newcomers, a former committee member and a director of personnel from one of our larger member companies.

From Everett, Wash., comes Al Perigo, a Traffic Committee member, who will discuss a plan recently begun which has enabled his company to lower its traffic expenses eight cents per station under last year's costs while handling 7½ per cent more traffic than the preceding year. It has required a new and different type of traffic budget and he has titled his address "Responsibility Accounting in the Traffic Department."

Heading east, the committee with the able assistance of Merle Hale, chairman of the USITA Personnel Committee, was fortunate in being able to line up Walter F. Roberts, personnel director of the Lincoln (Neb.) Telephone & Telegraph Co., whose subject will be "Motivating Manpower." The Traffic Committee is happy to be able to include a speaker on this vital subject as the future of Independent telephony lies in its ability to develop young people and to bring out the best in newer people.

G. W. ROSE
Traffic Committee Chairman

Continuing eastward, the committee is happy to include in its program an outstanding traffic woman from Owosso, Mich., whose topic will be "The Chief Operator in her Everyday Job." Miss Lydia Mielke, traffic supervisor of the Union Telephone Co., is thoroughly experienced in her subject having worked her way up through the ranks to chief operator and then onward to her present job. Miss Mielke is a former member of the Traffic Committee and we are looking forward to having her back on our program this year.

Turning southward, the committee

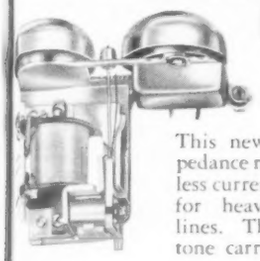
(Please turn to page 70)

Exhibitors At National Convention

Modern and up-to-date telephone equipment and supplies will be on display at the coming USITA convention. Independent manufacturers and suppliers can and do render vital assistance and advice to operating companies in solving their problems. Be sure and visit them in their display rooms, listed alphabetically below. This list was furnished by the USITA Manufacturers Exhibit Committee and is complete as of Sept. 21.

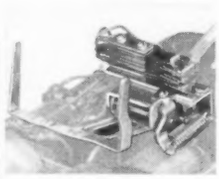
Acme Visible Records Inc. . . . . 639-A—640-A
Addressograph-Multigraph Corp. 522
Ansonia Wire & Cable Co. 547
Automatic Electric Sales Corp. . . . . 504—505—507—509
W. M. Bashlin Co. 530-A
L. M. Berry & Co. 556-A
Buckeye Telephone & Supply Co. 532-A
Burroughs Corp. 613
C. & D. Batteries Inc. 536
Cable Breather Co. 660-A
Cable Spinning Equipment Co. 556
A. B. Chance Co. 521-A
Churchill Cabinet Co. 610-A
Cook Electric Co. 539-A
Copperweld Steel Co. 542-A
Diamond Wire & Cable Co. 612-A
Directory Distributing Associates, Inc. 611
The Electric Storage Battery Co. 528-A
Electric Specialty Co. 609-A
Engineer Service (McElroy Carrier) 612
The Everstick Anchor Co. 539
General Telephone Directory Co. . . . . 533—601
Gould National Battery, Inc. 537-A
Graybar Electric Co., Inc. . . . . 621-A—622-A—623-A—624-A
Gustav Hirsch Organization 557-A
Henkels & McCoy Contractors 657-A
Hi-Way Trailer Co. 520
Holtzer Cabot Co. 524-A
Independent Telephone Pioneer Association . . . . . 535-A—536-A
International Business Machine Corp. . . . . 639—640
Ka-Mo Tools, Inc. 611-A
Kato Engineering Co. 550
Kellogg Switchboard & Supply Co. . . . . 500—501—502
Leich Sales Corp. . . . . 512—513—557
Lenz Electric Mfg. Co. 553
Line Equipment Sales 658-A
Line Material Co. 656-A
Loomis Advertising Co. 561
Lorain Products Corp. 515-A
Lynch Carrier Systems Inc. 638-A
McCabe-Powers Auto Body Co. 548-A
Motorola, Inc. 563-A
National Carbon Co. 553-A
National Telephone Supply Co. 550-A
Neale Construction Co., Inc 556
North Electric Mfg. Co. . . . . 517-A —519-A — 520-A — 619-A — 620-A — 626-A
Peterson Engineering Co. 603
Philco Corp. 600
Plastic Wire & Cable Corp. 657
Raytheon Mfg. Co. . . . . 511-A—658—659—660
Recordak Corp 659-A
Reliable Electric Co. . . . . 512-A—513-A
Remington Rand Co. . . . . 544-A—546-A
Ripley Company Inc. 602
R T & E Co. 612-A
Runzel Cord & Wire Co. 561-A
Schauer Mfg. Corp. 537
Sherron Metallic Corp. 560
Stromberg-Carlson Co. . . . . 504-A—505-A—507-A—509-A
Suttle Equipment Co. . . . . 519—529
Telephone Engineer Publishing Corp. 560-A
Telephone Answering & Recording Corp. . . 521
Telephone Repair & Supply Co. 516
Telephony Publishing Corp. . . . . 533-A—534-A
Tele-Wire Supply Co., Inc. 549
USITA Plant Committee 523
United States Motors Corp. 602-A
The Whitney Blake Co. 534
Wyoming Valley Equipment Co. 613-A

NEW, SINGLE-COIL, HIGH IMPEDANCE RINGER



This new high impedance ringer draws less current, is better for heavily loaded lines. The bell-like tone carries well.

NEW, MORE POSITIVE, TROUBLE-FREE HOOKSWITCH



No telephone can be better than its hookswitch. This Leich 700 hookswitch has been carefully engineered so you can depend on it for many years of dependable operation.

HANDY LIFT PLATE

Not only will your customers appreciate this sure-grip finger hold. You'll like it too because it will reduce the possibility of dropping the telephone.

telephone have all these FEATURES?

You can't expect your present old-style telephones to have all the latest engineering features. Nor can you expect them to have the modern design and service extras that will make your subscribers tickled pink about your service.

Read—on this page—about all the wonderful, **practical** new advantages that you can have with this LEICH 700 telephone.

Why wait? The next time you need instruments, buy this new, improved LEICH 700 telephone. You're getting **more** telephone for your money. **Write today for catalog and prices.**

ALL PARTS EASILY ACCESSIBLE

Your service men will appreciate this telephone. Loosen one screw and the cover comes off. All parts are in full view, easy to get at. All parts may be individually replaced whenever necessary.

ADAPTABLE FOR EVERY TYPE OF SERVICE

This one telephone is available or can be easily adapted for every common battery or dial service requirement. It can be furnished for every kind of ringing, there's provision for ringing tubes, it's available with a hookswitch latch.

THE SAME INSTRUMENT IS EITHER WALL OR DESK MODEL

You save time and money with this feature. For desk use, set your Leich 700 telephone down. For wall installations, just turn it over and mount it on the wall. In this way you need to stock fewer telephones, your installer always has the right telephone.

MANUFACTURERS OF TELEPHONES, SWITCHBOARDS AND RELATED APPARATUS SINCE 1907

LEICH SALES CORPORATION 427 W. RANDOLPH STREET CHICAGO 6, ILLINOIS

PACIFIC COAST: 2611 SAWTELLE BLVD., LOS ANGELES 64, CALIF. SOUTHWEST: 1227 SLOCUM ST., DALLAS 7, TEXAS

GENERAL TELEPHONE TELEPHONE SYSTEM

Illinois Company Cuts Over To New Look In Revenue Accounting

ALL REVENUE accounting operations at the general offices of the Illinois Central Telephone Co., Clinton, Ill., have taken on a "new look" since the recent completion of a "cut-over" to new and more efficient revenue accounting methods. Over several months the company has adopted a series of changes in methods of preparing toll and local exchange billings for its 22,500 telephones. These changes included mechanization of bill and ticket handling which resulted in greatly improved efficiency and cost reduction of the company's revenue accounting functions.

JOYCE LEGGETT (left), chief toll billing clerk, watches BARBARA REYNOLDS (center) and CONNIE SPRAGUE sorting tickets with the LeFebure toll ticket sorting equipment. There are one or more sorting trays for each of the company's exchanges.

One of the outstanding features of the new installation is the adoption of LeFebure toll ticket sorting equipment (TELEPHONY, Apr. 10; p. 22). This new method of sorting 140,000 tickets per month involved the installation of LeFebure ticket sorting trays which replaced the former standard ticket sorting racks and desk top sorting methods. This system has proven to be a great time saver over the generally accepted rack sorting method previously used, according to the company.

The company has also put into operation Recordak toll ticket microfilming equipment and is now sending to its subscribers each month, their original toll tickets instead of the former typed toll statement. A record of all tickets is maintained on microfilm at the company's revenue accounting center. Customer reaction to receiving original toll tickets is reported to be favorable and time required to look up toll tickets is greatly reduced.

Other changes in the revenue accounting procedures included the installation of a standard National Cash Register utility billing machine and the change over to a six-cycle billing system, to even out the work load, in place of the former plan of billing all subscribers on a calendar month basis.

A postage meter was also installed to expedite the dispatch of the company's large volume of mail.

Previous to the new set-up, about two-thirds of the company's toll billing was done at exchanges. All exchange bills were prepared at the company's revenue accounting center and sent to these exchanges for posting toll and mailing to subscribers.

The "new look" centralized the toll billing and bill mailing functions, together with the already centralized revenue accounting functions, completely, at considerable cost reduction in the field, with only a minor addition of employe hours in the revenue accounting office.

The change-over, which went through without a major "hitch," required considerable preliminary planning and months of special effort by revenue accounting personnel, to carry the plan through step by step, to final completion. C. R. Aagaard, auditor of the company, directed the planning and supervision of the conversion, with the assistance of Ellen Griffith, revenue accountant, and Joyce Leggett, chief toll billing clerk.

V V

Two Kentucky Companies Incorporate

Two Kentucky Independents recently were reported to have become corporations. They are:

Calvert Telephone System, Inc., Calvert City, capitalized at $100,000. Incorporators: Leroy T. Carlson of Chicago and Bertel T. Malmquist and Lawrence W. Peterson of Wilmette, Ill.

Vine Grove Telephone Co., Inc., capitalized at $50,000. Incorporators: Max E. Hosea, and Clara I. Hosea of Indianapolis, Ind., and Batia Hosea Calvert of Mishawaka, Ind.

V V

Bell of Canada Completes Purchase of Company

Bell Telephone Co. of Canada has purchased the outstanding minority interest in the Welland County Telephone Co., Fort Erie, Ont., and will amalgamate the company's exchanges and its 6,500 telephones into its network, it was reported on Sept. 11.

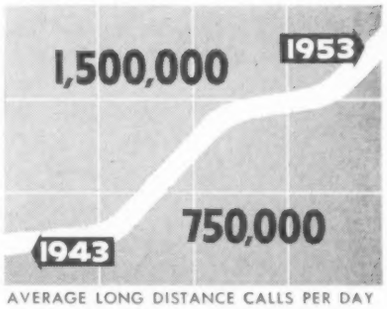
Bell has owned 26,000 of the 27,000 shares of the Fort Erie company since 1929.

→

On the page at the right is the sixth advertisement in the national campaign of the United States Independent Telephone Association to publicize the Independent telephone industry. The ad will appear in the Oct. 11 issue of *Time*, and did appear in the Sept. 24 issue of *U. S. News & World Report*.

Look what happens during an average day

. . . in 5,100 Independent Telephone Companies across the land.



AVERAGE LONG DISTANCE CALLS PER DAY
for Independent Telephone Companies

● 100,000 employees at 11,000 exchanges keep telephone lines humming 'round the clock. ● 35 million local calls are made over 9 million Independent telephones. ● Operators at busy switchboards complete as many as 1,500,000 long distance calls. ● More than $300,000 worth of new telephone equipment and plant facilities are added to growing Independent companies. ● Every minute of the day, another Independent telephone is placed in service

Any way you look at it . . . by the day . . . by the month . . . by the year . . . the 1½ billion dollar Independent Telephone Industry is one of this country's fastest growing businesses!

• Telephone instrument in photograph above manufactured by Automatic Electric Company, Chicago, Illinois.

USITA

United States Independent Telephone Association

Pennsylvania Building : Washington, D. C.

The OPERATOR'S CORNER

by MAYME WORKMAN, Traffic Editor

THERE is a saying "History repeats itself," and that applies to the telephone industry, too. Not so long ago, due to a shortage of facilities, particularly toll circuits, we were discouraging customers from placing long distance calls and talking for long periods of time.

We have now reached a point where we are encouraging customers to place more long distance calls and to talk longer, because the facilities for doing so are available and because, as in every other business, telephone companies need the additional revenue.

Modifications in toll operating practices intended to promote long distance calling and to make the service more attractive to customers, have been made recently. These modifications include: Avoiding the use of the word "overtime" when notifying the customer that the initial talking period has ended, as we do not want to give the customer the impression that we are encouraging him to end his conversation; modified phrases for quoting rates, securing coin deposits and notifying at the end of initial period; and reaching a clear understanding with the customer as to when the next attempt on his call will be made, when a report is given requiring subsequent action.

In view of the current level of long distance calling and the improved circuit situation, it is important for operating forces to do everything practicable to promote long distance usage and, at the same time, give a grade of service as fully sensitive to the customer's desires as possible. Thoughtful attention is urged to the administration of all long distance practices and most particularly to the manner, tone and helpfulness with which the service is being rendered.

While we hope there was no letdown in courtesy during the period when long distance calling was of necessity restricted and, in some instances, even curtailed, now that we have an abundance of service to sell, it is certainly to the interest of every operator and every telephone employe to make a sincere effort to sell as much service as possible.

Business in general is becoming more and more conscious of the importance of the customer's wishes and desires and the need for rendering service that is pleasing and acceptable.

I was agreeably surprised recently when a gentleman from our bank called at my office for what he termed "just a friendly call" to determine if the bank service was satisfactory and if we had any suggestions to improve it.

The bank installed a "drive-up deposit window" recently and he asked what we thought of it. His visit was friendly, brief and to the point and it left me with a feeling that I was glad we transacted our business with this particular bank. It seems to me, the bank is not only interested in obtaining new accounts, but also in keeping its present customers happy and satisfied. This is certainly an important thing in every line of business, since old, as well as new customers, are necessary to operate successfully.

That also applies to the telephone business. The best way to keep our customers happy and satisfied is to render courteous, pleasing, accurate and prompt service. To a large extent this is the job of the switchboard operator who comes in most frequent contact with the customers.

Another instance of courtesy I observed recently occurred when I found it necessary to call for assistance in the operation of a new electric stove. One of the gadgets wouldn't work and the young man who came to look over the situation found that the trouble was caused by pushing the wrong button.

Instead of making me feel that I was a "dumb cluck" for not knowing any better, he tactfully said that perhaps when the stove was installed, I had not received all of the instruction I should have been given in its operation. He invited me to ask as many questions as I wanted in regard to the operation of the stove.

In thanking him when he departed I said I was sorry I had called him for such a trifling matter. He replied, "I was very glad to come, that is what we are in business for—to be of service to our customers." What a fine attitude! I'm sure that young man will go places in his chosen vocation.

In my present work, "our business" seems like "my business' and I am very happy to see it grow and prosper, to keep down the operating expense of the business wherever possible.

If we can do our job in the same spirit as the person who is operating his or her own business, we will do a good job and will derive a world of satisfaction out of the service we render.

Traffic Questions

(1) If the called number is not supplied by the calling party on a long distance call, should the number be given to the party when it is obtained?

(2) What phrase is used in giving the number of the calling party on a long distance call?

(3) On a long distance call, if the calling party is holding the line when the desired number is secured from another operator, how should the operator proceed?

(4) On an outward call, if you reach an intercepting operator and she asks what number you are calling, what should you say?

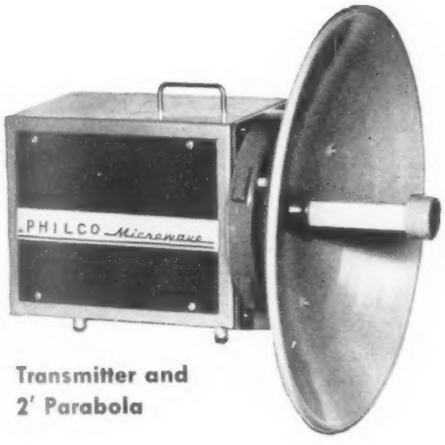
(5) If an intercepting operator at a distant office requests additional information which you cannot furnish, is it desirable to permit her to deal directly with the calling party?

Answers are presented on page 77.

A NEW PHILCO TV RELAY WITH 4000 WATTS ERP!*

FOR REMOTE PICKUP AND S-T-L

- Monochrome and full NTSC color
- Multi-band service . . . 5925-7425 mc
- Sound channel meets FCC specifications
- Built-in frequency monitors
- Completely weather-proofed RF heads
- Protective voltage interlocks
- Relay rack and suitcase mounting



Transmitter and 2′ Parabola

Receiver and 2′ Parabola

Transmitter Control and Power Supply

Receiver Control Unit

Broadcasters! Here is the latest in TV remote pickup and S-T-L equipment . . . a Philco TV relay unit which gives you an ERP* of 4000 watts (using 4′ parabola) . . . noise-free transmission and reception . . . and *occupies no more space than present monochrome units supplying only one-tenth the power!*

Heart of this new Philco Microwave equipment, Model TLR-3, is a reliable klystron—the one used in Philco multi-channel communications equipment—which provides *a full watt* of transmitter output. Use of interchangeable klystrons permits maximum efficiency in covering frequency ranges between 5925 and 7425 mc. RF units are completely weatherproof and all units are suited to rack mounting in fixed installations. A light weight portable tripod is available for mounting transmitter RF and receiver RF assemblies in the field. Get information on this new Philco TLR-3. Write Philco, Dept. TY, today.

Receiver Power Supply Unit

*EFFECTIVE RADIATED POWER

PHILCO CORPORATION

GOVERNMENT & INDUSTRIAL DIVISION • PHILADELPHIA 44, PA.

THE PLANT MAN'S Notebook

by Ray Blain, Technical Editor

CUSTOMER DIALING over extended areas, of wider range and connected with the national toll plan, is presently increasing at a tremendous rate. Beginning this summer, dial telephone users in San Francisco and the east bay area will dial their own calls to more than one million telephones in some 50 communities around the bay area.

Now, also, 630,000 telephones in New York's midtown Manhattan area can make dial calls direct to 1,300,000 telephones in northern New Jersey.

However, this service may be used for number or station-to-station calls only. In the event you desire to make a person-to-person call, you must place it with the operator in the old-fashioned manner.

There is little doubt that the dial system will encourage the use of station-to-station service. It is believed that in many cases, subscribers will take a chance and dial a number call in the hope that the desired person is present. If the called person is not present, in many cases, word will be left for him to call back later. This undoubtedly will cause considerable increase in short-haul toll service.

We wonder how long it will be before we shall be able to dial a person-to-person call. While we must admit at this time, this idea is just a gleam in an engineer's eye, we do not doubt but that eventually someone will solve this seemingly impossible problem.

• • •

The Washington, D. C., area fliers can now dial for the aviation weather, in a new weather recording service set up by the Chesapeake and Potomac Telephone Co. Dial DIstrict 7-4950 and you will hear a male voice rendition of local and regional air weather conditions. Included are such items of pilot interest as cloud ceilings, storm locations, and wind velocities at flight levels.

This service was suggested by the local Pilots' Association. The grounded population may continue to obtain its weather version by dialing WEather 3-1212.

• • •

Some plant men seem to be of the opinion that to spray for weed and foliage control under rural and toll lines they must hire contractors who are equipped with large power spraying outfits.

While this practice will usually prove desirable and economical on all large spraying jobs, there are many small jobs that can be successfully handled by the regular maintenance force if they are properly equipped with suitable small sprayers. Many of these small sprayers are operated from a cylinder of nitrogen gas, are convenient to use, and prove quite effective.

• • •

In Louisville, Ky., recently we noted some outdoor type public telephone booths painted white with red tops and red with white tops. We have also seen these booths painted green, white-and-red striped and green-and-white striped. Perhaps the most outstanding colors that we have noted was one striped black and yellow.

At one time, we thought that the color of these booths should be standardized, but now we doubt if this will be necessary. The installation of these booths is increasing at a tremendous rate, they are being freely used, and certainly serve a most useful purpose. We are now of the opinion that the color they are painted is of no particular significance.

• • •

There is every reason to believe that self-supporting thermoplastic aerial cable is here to stay. This type of construction is presently doing a wonderful job in the provision of service in various sections of the country. This cable is now available in 6, 11, 16 and 26 pairs. We understand that in a few cases, 51-pair cable has been used successfully on self-supporting plant.

This cable is available in either No. 19 AWG hard-drawn copper conductors or No. 19 AWG 40 per cent conductivity Copperweld. Either type of conductor appears to have ample strength to support the cable on the required span length to make this type of construction economical.

Preformed aluminum dead-ends and tangent supports, designed for use with this cable, are inherently split and are manually wound around the periphery of the cable at the time of installation in a matter of seconds. This grip is designed to distribute the compression over a relatively large area of the cable sheath to eliminate the possibilities of damage to any of the cable components even under tensions up to the breaking strength of the cable.

The tangent intermediate supports consist of a complete coverage of spiral armor wires which reinforce the cable at the support where the cable is attached to the pole.

TELEPHONY Convention Classified Ad Board

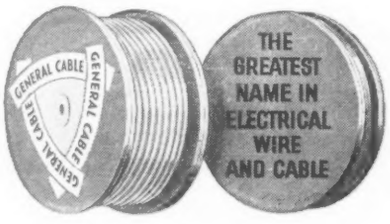
If you have something you want to sell or buy, or if you have some other proposition you'd like to let others know about, during the USITA convention, we will be glad to post your advertisement on TELEPHONY's Convention Classified Ad Bulletin Board.

When you visit us in Suite 533-A and 534-A at Hotel Conrad Hilton on Oct. 11 to 13 (and we hope all of you attending the convention will do so), bring along your message and we will serve as your clearing house—for free.

We will also have our usual feature—a recorder, enabling you to "talk a letter home," which you can play back. Then we will mail it to your designated addressee.

THE GREATEST NAME IN ELECTRICAL WIRE AND CABLE

TELEPHONE DROP WIRE...



BARE, WEATHERPROOF, INSULATED WIRE and CABLE FOR EVERY ELECTRICAL PURPOSE

General Cable – the nation's only supplier of a complete line of telephone wire and cable of *all* types – combines broad manufacturing facilities with more than half a century of practical experience. This combination produces unusual dependability and longer service life in Telephone Drop Wire.

Designed to resist excessive weathering, exposure to sunlight, abrasion and corrosive chemical vapors, they are available with two conductor (twisted pair or parallel) and with multiple conductor constructions . . . with copperweld, bronze or copper conductors.

Here are a few of the more popular types:

Figure 8 Mid Rip All Neoprene
NEOTEL (Rubber-neoprene) parallel and twisted pair
Reinforced and Nonreinforced
GENCASEAL (Plastic) Six Pair Multi-Drop

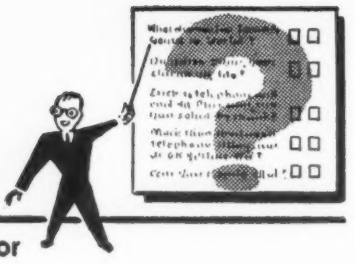
Of course, special constructions are available to meet your requirements. You name it . . . we'll design and make it. New Brochure gives complete facts fast! Write today!

For fast service see our national distributor:
AUTOMATIC ELECTRIC SALES CORPORATION • CHICAGO, ILL.

GENERAL CABLE CORPORATION

420 Lexington Avenue, New York 17, New York • Sales Offices: Atlanta • Boston • Buffalo Chicago • Cincinnati • Cleveland • Dallas • Detroit • Greensboro (N. C.) • Houston • Indianapolis • Kansas City • Los Angeles • Memphis • Milwaukee • Minneapolis • New York • Newark (N. J.) • Philadelphia • Pittsburgh • Portland (Ore.) • Richmond (Va.) • Rochester (N. Y.) Rome (N.Y.) • St. Louis • San Francisco • Seattle • Syracuse • Tulsa • Washington, D. C.

PLANT MAN'S QUIZ



by RAY BLAIN, Technical Editor

Q. What method is recommended for the prevention of interruption to service from accidental contact of binding posts in cable terminals of special circuits?

A. The usual method is to place binding post insulators on the pair in all terminals at which the special pairs multiple. These insulators are available in two sizes: the No. 1 binding post insulator for use on 3/8-inch nuts, and No. 7 fuses. The No. 2 binding post insulators are available for use on the 7/16-inch nuts of the 7-A fuses.

These simple insulators may be purchased at a small cost from your telephone supply house.

• • •

Q. When a telephone line is placed on a joint power line carrying more than 5,000 volts, what type protectors should be used to insure safety on the telephone line?

A. In cases of this nature, the use of a special protector is recommended which consists of three cylindrical carbon electrodes, permanently mounted on a porcelain base. This protector is equipped with a steel cover and supported by a metal bracket.

The three carbon cylinders are separated by an air gap of approximately 1/8 inch that is designed to break down at about 3,000 volts. Each of the electrodes is connected to a lead wire which is connected through the base. One lead is normally connected to ground and the two others to the telephone line wires.

In order to provide protection from the higher voltage on jointly used pole lines, these protectors are generally placed on each pair near the beginning and end of the jointly used line.

It is also a good plan to install these protectors at 1/2-mile intervals along the exposure. A protector is also usually placed near the subscriber's telephone, generally at the point where the drop leaves the jointly used line.

• • •

Q. What is an Optiphone and how is it used?

A. The Optiphone was a piece of equipment developed by the Signal Corps during the late war, but not extensively used. It was designed to provide single-channel, two-way, break-in speech communication over a narrow beam of white or dark red light.

The field equipment consisted of an optical unit, control unit, six-volt storage battery, field telephone and accessories. The complete unit weighed about 145 pounds.

• • •

Q. We are planning the conversion of our common battery telephone system to dial operation. In general, what repairs will be required to condition the old outside plant for dial service?

A. If your plant is in good condition, very little if any repair or rebuilding should be required. However, you must make certain that the insulation of your cable is good, the drop wire is in good repair, and high resistance joints and tree interference are eliminated.

Conditions of low insulation in the cable, which may not cause serious trouble in the common battery system, may immediately interfere with the operation of dial stations served from low-insulated conductors. These failures are due primarily to the breakdown effect that the high induction voltage surges inherent in dial systems have on low conductor insulation.

If there is any question as to whether the cable conductor insulation is satisfactory for dial operation, a check should be made with proper testing instruments prior to making the conversion to dial.

It is suggested also that you check your drop wire plant carefully. With some of the older types of drop wire, as the insulation ages, it "checks" and because of the close proximity of the two wires of the pair, an electrical path is provided during wet weather. This leakage, which may not be more than enough to impair slightly transmission or ringing on a manual system, may, in a dial system, cause "premature ring cut-offs."

The drop wire plant should be considered from this point of view and thoroughly checked and replaced, as required, prior to the conversion.

It is also a good plan to check the tree conditions in the exchange before the conversion. When tree branches have grown against bare wire lines, they may reduce the insulation to ground to such an extent that dial operation may be seriously impaired. Trees should all be trimmed or open wire lines replaced with cable.

• • •

Q. We have a rural line that is causing considerable trouble as a result of poles breaking off at or near the ground line during high winds. These poles are not high enough to reset and we are considering stubbing. In your opinion, are we justified in making repairs in this manner?

A. In general, stubbing is usually considered only as a temporary expedient and should not be done on a wholesale basis. If the line is so old that the majority of the poles are breaking off at the ground line, then we believe that you should consider the installation of new poles.

We doubt very much if stubbing practically all your poles would prove to be economical in the long run.

Convention Attendance

The United States Independent Telephone Association has asked that the following announcement be made:

"Representatives of all Independent telephone companies in the United States are cordially invited to the USITA convention at the Conrad Hilton Hotel in Chicago on Oct. 11, 12 and 13, whether or not they have membership in the association.

"Attendance of representatives of manufacturers and suppliers, however, will be limited to those having membership in the association."

V V

"It is quite probable that historians will call these present times a period of decision. We seem to have reached a plateau in our national history—a time of taking stock of our past accomplishments, a time for realigning our sights on the goals which still lie ahead. Many of the seemingly brilliant short cuts and liberal ideas attempted during the past generation are badly tarnished already. To some of our citizens, the effect is one of disillusionment." — **CLIFFORD F. HOOD,** ***president, United States Steel Corp.***

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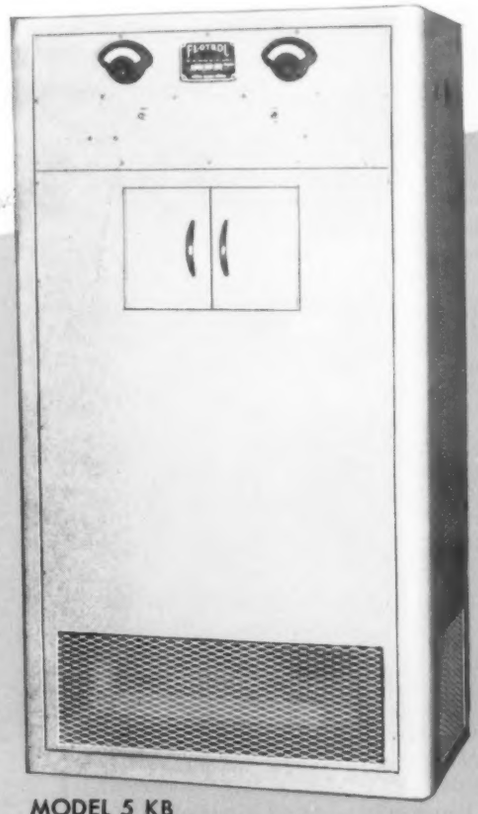

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For complete information write for Bulletin 161 listing three-phase FLOTROLS from 25 amp. to 200 amp. Single-phase FLOTROLS ranging from 1 amp to 24 amp. are listed in Bulletin 160.

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SUB-CYCLE

Factors in the Selection of Telephone Carrier Systems

by HAROLD R. HUNTLEY

PART 1

CARRIER is coming to be the primary method of supplying telephone circuits which are over a relatively few miles long. For example, a very large proportion of the circuits in the Bell System over about 100 miles long are now on carrier and practically all of the growth in circuits over about 25 miles long is obtained by means of carrier. The main reason why there are any voice frequency circuits left over 25 or 30 miles long is that carrier systems of types which are economical down to these lengths have not been available for enough years to displace these voice circuits through growth. With developments now in the offing, we expect that within a few years we will be using carrier for even shorter distances.

The rapidity with which new and more economical carrier systems have been developed has been paralleled by equally rapid changes in concepts as to where and when they should be used. For example, up until about the end of World War II, carrier was generally considered as something quite special and its use was pretty well confined to a relatively small number of open wire lines and to a few cables which were of special types (such as coaxial) or were specially treated (such as twin K cables). It was basically considered as a long-haul system. However, since that time, carrier has come to be used almost everywhere; the applications to open wire have been greatly extended; it is being applied to all kinds of cables —existing as well as new—without expensive special treatment and it is being applied in large quantities to radio. No longer is it a pampered thoroughbred; it has established itself as a fine all around workhorse.

*Mr. Huntley presented this address at the 1953 Signal Corps Symposium on Communication Wires and Cables.

And in such a widespread application several kinds of carrier systems must be used. No one system is best in the over-all sense; each kind is best only for a particular set of circumstances. Therefore, while different types of carrier systems are, in a manner of speaking, competitive, the more important fact is that each complements the other.

In such a situation it is evident that the selection of the type of carrier system which will do the best and most economical job under a particular set of circumstances must involve consideration of a number of factors. It is this complex of factors—rather than the detailed technical description of carrier systems—that I want to talk about today. The factors involved include such things as costs of lines and repeaters, costs of terminals, number of circuits to be provided for, flexibility, etc.

Why Carrier Is Used

Before going into detail regarding the factors involved, I think it would be worth while briefly to review some of the general considerations which apply to carrier systems of all types.

The most obvious reason for considering the use of carrier at all is, of course, that under many conditions circuits can be provided cheaper by carrier methods than by voice frequency methods. A less obvious consideration is that circuits provided by carrier are, in general, superior from the transmission standpoint to voice frequency circuits.

THE AUTHOR

Harold R. Huntley has had 36 years of experience in communications transmission work. Joining the Wisconsin Telephone Co. in 1917, as transmission and protection man, he took a year out to complete work for his B.S. degree, returned to the company in 1921, and subsequently became transmission and protection engineer and, in 1928, transmission engineer.

In 1930 he moved to New York and AT&T, where he was an Operating and Engineering group head in the plant engineering division, and later in charge of groups handling electrical coordination and toll transmission. For three years he has held the position of transmission engineer. He is a Fellow of the American Institute of Electrical Engineers and a Senior Member of Institute of Radio Engineers.

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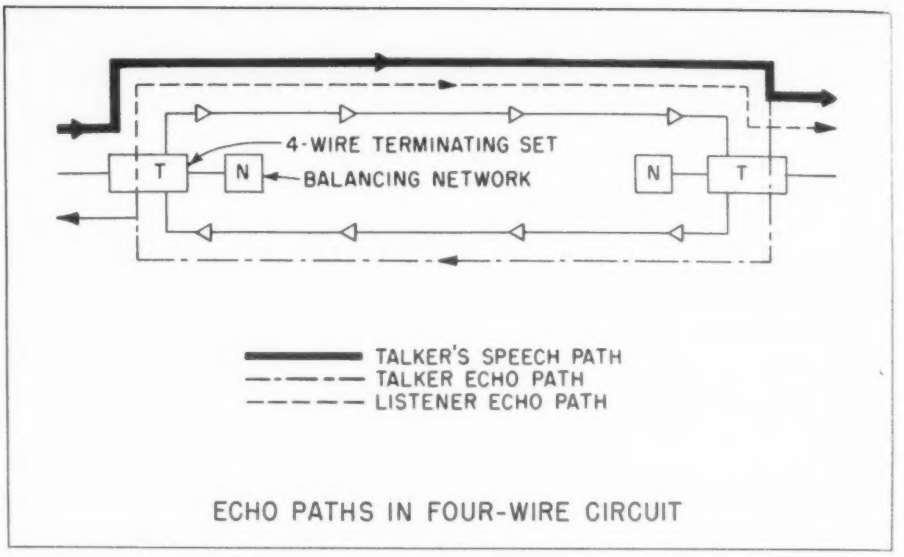
Costs. We might examine briefly how it is that carrier produces cheaper circuits than voice frequency methods.

Carrier reduces costs only by one method; it reduces the cost *per circuit* of the base facilities—that is, the open wire or cable pairs or radio links on which carrier may be placed—by dividing them up among several or many circuits.

It is worth while noting that I have deliberately put radio in the same class as an open wire or cable pair. And this is as it should be because radio does the same thing as a physical pair in that it provides a wide-band "channel" which is, in the last analysis, nothing more nor less than a usable slice of frequency space. The major difference between a radio channel and a cable or open wire pair—aside from their obvious physical difference—is that a pair of wires can be used directly at voice frequency (or even at dc) whereas with radio some type of carrier gear is always needed, even for a single telephone circuit.



ECHO PATHS IN FOUR-WIRE CIRCUIT

Chart I

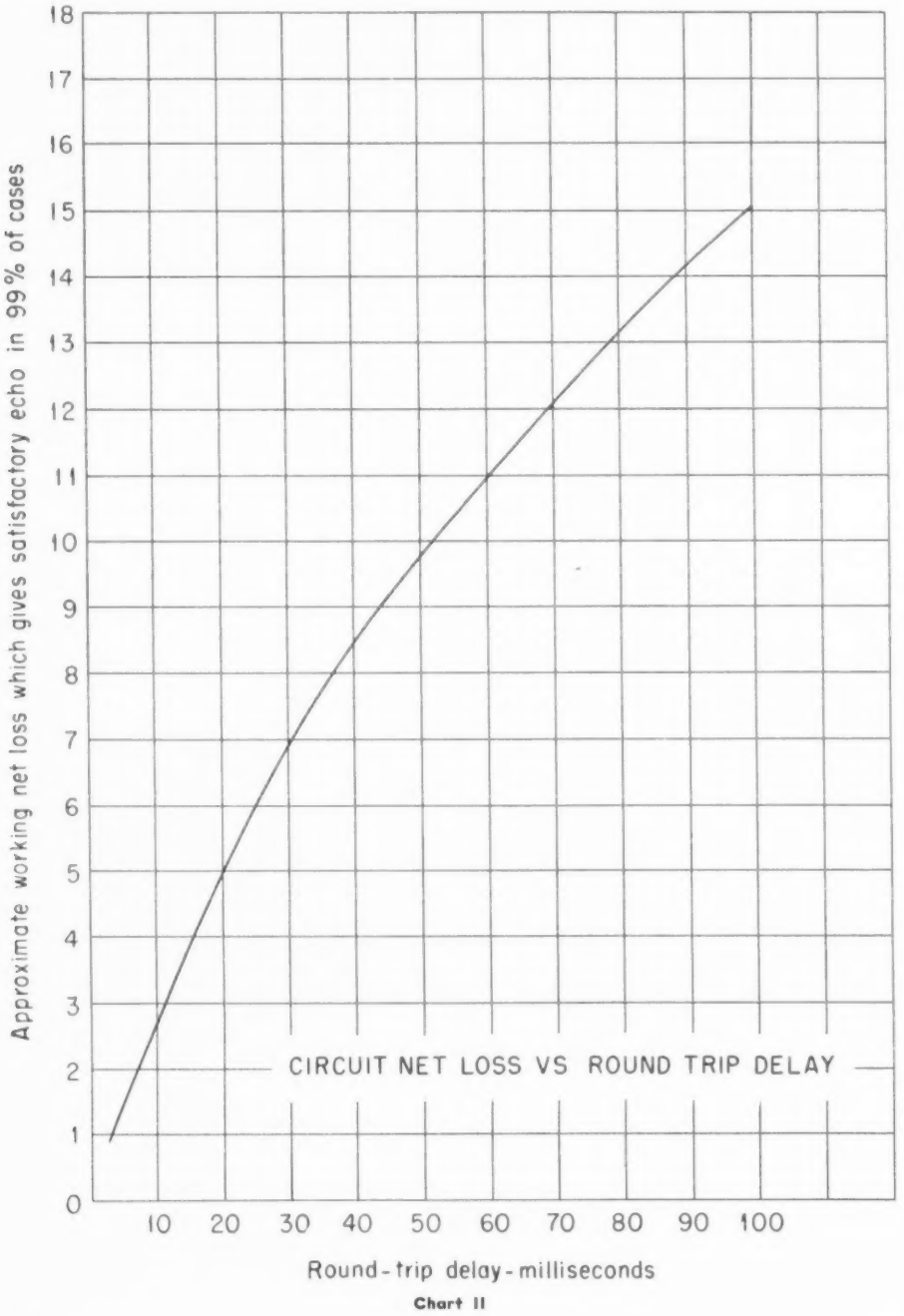


Chart II

Also, in talking about carrier, I am not differentiating between time and frequency division methods, or between the different types of modulation, since they do not affect the basic objective of carrier; i.e., to reduce the costs per circuit of the base facilities by dividing these costs among several or many circuits.

But while carrier is very effective in reducing the contribution to over-all circuit cost of the base plant (by dividing these costs among several or many circuits), it does so only by virtue of the fact that more complex and expensive equipment is used at the circuit terminals. (We also have to use, in many cases, more complex amplifying gear (repeaters) at frequent intervals along the line but, in general, the costs of these repeaters are not a controlling factor in the over-all costs of carrier systems). Basically then, *over-all* economies are obtained by carrier only when the costs of the carrier gear which is put at the ends costs less than the amount which is saved in between.

The savings in base plant are proportional to the number of miles between terminals and if this number is large, the savings are large and it is relatively easy to keep the cost of the terminal gear below that which has been saved in the line. The really tough economic problems come about when we attempt to use carrier for the shorter lengths because the amount saved in line costs is smaller and the only way we can get over-all savings is to make the terminals cheaper—a tough job. However, we are making real progress on this problem. For ex-

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New clamp-type rung brackets add to rigidity, permit rung removal without tearing down ladder. Standard construction in Series 2100 and 2200.

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SERIES 2200 MECHANICAL TYPE AERIAL LADDER—Full 360° rotation, worm and gear operated by hand crank. *Ladder pivot shaft mounted on roller bearings, counterbalance spring cable operates over sheave mounted on roller bearings. One chrome vanadium alloy spring concealed in mast results in fully counterbalanced ladder. Elevation from horizontal to maximum angle of 72° accomplished by 2½ effortless turns of hand crank controlling pinions and gear segments. Fly section extended and retracted by hand operated windlass with brake. Upper and lower sections insulated for 750 volts. Available in three models —23, 27 and 31-ft. ground to platform heights.

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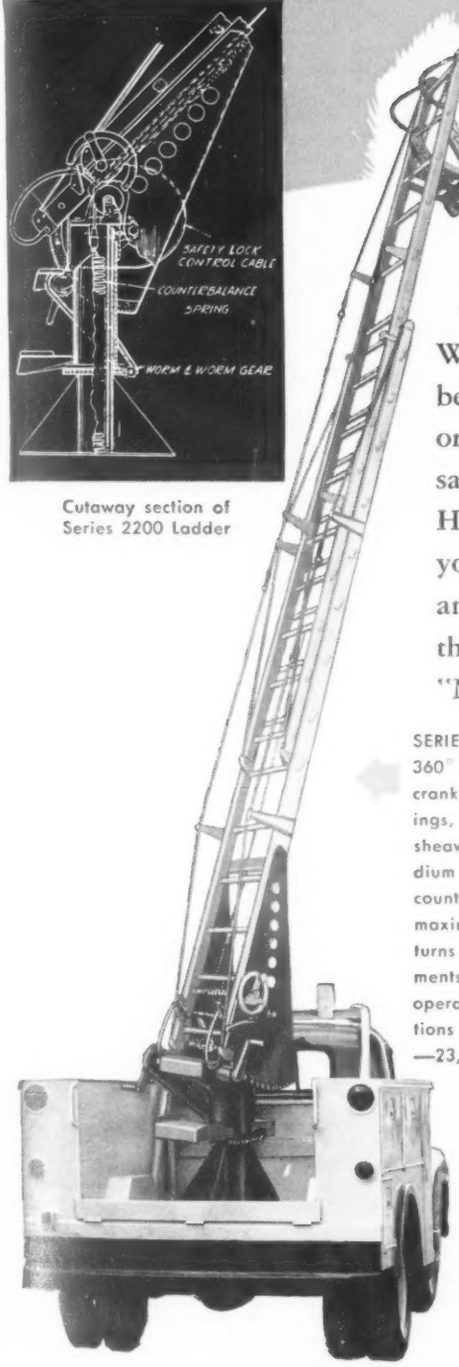

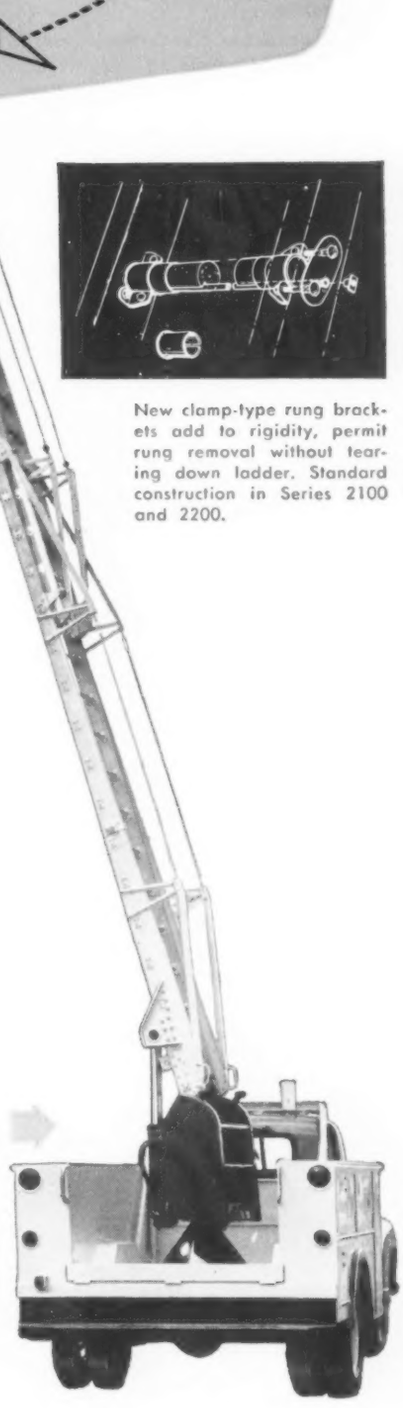

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ample, before World War II, there were very few carrier circuits less than about 100 miles long, but as indicated above, we have now got to the point where we use carrier for practically everything over about 25 miles. We are setting our sights at continued development which we hope will let us use carrier down at least to the order of 10 miles.

Transmission Characteristics. In addition to providing cheaper circuits in many situations, carrier provides circuits which are superior to voice frequency circuits from the transmission standpoint. This is a very important factor in the operation of a complex telephone network, because it not only improves transmission over the connections which are established, but it also permits more economical operation by greatly reducing transmission limitations on the connections that can be established by switching individual circuits together.

This improved transmission performance comes about by two facts:

(1) The circuits are higher velocity—usually over 100,000 miles per second—than voice frequency cable circuits which have velocities in the order of 10,000 to 20,000 miles per second.*

(2) They are inherently four-wire which means that the two directions of transmission used in a two-way conversation are entirely separate electrically except at the ends.

*Open-wire voice frequency circuits are high velocity, but they are two-wire.

The high velocity of propagation is of great importance in any situation where the circuits are long or are used in connections having large total overall lengths. The advantage of high velocity resides not in reducing the delay between the time a talker speaks and the listener hears what he says—even at relatively low velocities the actual delay in hearing speech would be almost negligible unless we were talking about inter-continental distances—but rather in reducing the effects of "echo."

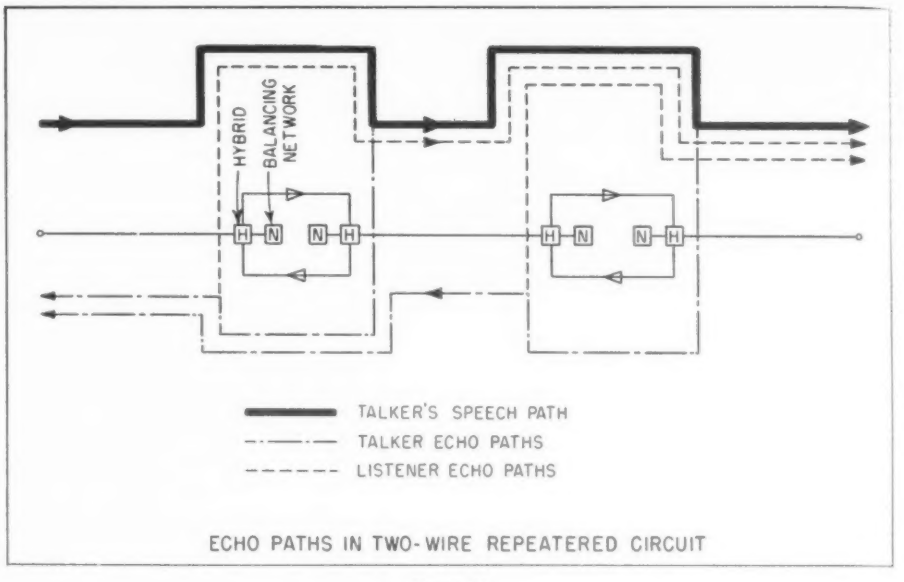


Chart III

Chart 1 shows what we mean by echo. (I have shown a four-wire circuit to simplify the explanation.) When the talker speaks, his voice currents travel down the line and due to the fact that there is a fairly large irregularity at the far end, part of the currents "leak" across the hybrid there and return to him delayed by twice the propagation time of the circuit. He hears them as an echo of his own voice. If the time required to make this round trip is very small, the returning voice currents sound to him like the sidetone he hears in his own receiver anyway and all that happens is that he hears his own voice louder than it otherwise would be. But if the echo is delayed a fair number of milliseconds, it sounds exactly like what its name implies; that is, it sounds like the familiar acoustical echo one hears when sound waves bounce back from an obstacle. In extreme cases the echo may be delayed enough and be loud enough so that the talker may think the other party is trying to interrupt him; that is very annoying.

What I have described is known as "talker" echo. There is also the possibility of "listener" echo; i.e., the listener may hear not only the normal speech currents but also repetitions of them delayed by the round-trip propagation time. However, with the exception of some special private line networks, talker echo is almost always louder and more annoying than listener echo and if we adequately control the former, the latter will automatically be taken care of.

Now, the loudness of the echo which people will tolerate depends on how long it is delayed—the longer the delay, the less must be the loudness. The only way we can reduce the loudness is to increase the loss which the voice currents suffer in their round trip out to the far end and back again.

This round trip loss is equal to the loss in the circuit out, plus the loss in the circuit back, plus the loss which the currents suffer in getting across the hybrid at the far end. This last loss (i.e., getting across the hybrid) is a function of the impedance balance between the loops and trunks used to complete the connection at that end and the balancing network and so far, at least, we have not been able to find any economical way to do anything about it because improving the situation would require substantial changes in the local plant. We just have to take it as it comes.

Therefore, the only way we have of controlling the loudness of the echo is by adjusting the circuit losses. However, we can't go too far in that direc-

(Please turn to page 77)

SUMMARY OF GENERAL CHARACTERISTICS OF CARRIER SYSTEMS

Type	Type of Line Facility	No. of Circuits per Pair	No. of Pairs in Typical Route	Circuit Capacity of Typical Route	Min. Convenient Group of Circuits
L3	Coaxial cable	1800	4	5400	60
L1	Coaxial cable	600	4	1800	60
K	Twin paired or quadded cables	6	70-200	420-1200	12
N1	Single paired or quadded cable	6	50-150	300-900	12
ON	Single paired or quadded cable	10	50-150	500-1500	4
O1	Open Wire	16	5-15	80-240	4

Chart IV

GENERAL CHARACTERISTICS OF CARRIER SYSTEMS

This table lists summaries of general characteristics of carrier systems manufactured by firms other than Western Electric Co. and was prepared by TELEPHONY, with the cooperation of the various manufacturers. (Note: Information on the systems of McElroy Mfg. Co. was not received in time to publish in this table.) Characteristics of the carrier systems manufactured by Western Electric are discussed by Mr. Huntley in the accompanying article. Following is the summary of general characteristics of the various carrier systems, designated alphabetically by manufacturer:

BUDELMAN RADIO CORP.

Type	Type of Line Facility	No. of Channels Per System	Type of Application
16A	Open wire	Up to 5	Subscriber (bridged ringing).
16B	Open wire	Up to 5	Subscriber (full selective ringing).
16AX	Open wire	Up to 5	Medium haul. E & M signalling.
16AR	Radio	Up to 10	Any radio equipment with suitable bandwidth (250 cycles to 100 KC).

KELLOGG SWITCHBOARD & SUPPLY CO.

Type	Type of Line Facility	No. of Channels Per System	Type of Application
5	Open wire and cable	1 to 3	Stackable: short or medium-haul.

LENKURT ELECTRIC CO.

Type	Type of Line Facility	No. of Channels Per System	Type of Application
32E	Open wire	1 to 4	Medium or long-haul.
33A	Open wire	1 to 3	Stackable; short or medium-haul.
45A	Open wire	4 to 12	Short, medium or long-haul.
45BN	Single paired or quadded cable	24	Coordinates with other cable systems; interconnects with 45A.
45BX	Radio	Up to 48	Any radio equipment with suitable bandwidth. (Interconnects with other 45-class systems.)
33C	Radio	Up to 24	Any radio equipment with suitable bandwidth.
33B	Radio	Up to 12	Any radio equipment with suitable bandwidth.

LYNCH CARRIER SYSTEMS, INC.

Type	Type of Line Facility	No. of Channels Per System	Type of Application
B28	Open wire	1 to 3	Stackable, short or medium-haul.
B37	Open wire	1 to 5	Stackable, short, medium or long-haul.
B60J	Open wire	1 to 12	Short, medium or long-haul. Coordinates with Western Electric "J" carriers.
B60JO	Open wire	16 (Four 4-channel groups)	Short, medium or long-haul. Coordinates with Western Electric "O" carriers.
B60N	Single paired or quadded cable	24	Coordinates with other cable systems. Interconnects with B60J.
B85	Radio	1 to 9	Stackable. May be used on any radio system with suitable bandwidth.
B109	Radio or open wire	1 to 10	Stackable, one-way. No signalling for in band transmission of telemeter or telegraph signals, or for voice multiplexing on any radio system with suitable bandwidth.
B60R	Radio	8 to 72	May be used on any radio system with suitable characteristics.

NORTH ELECTRIC MFG. CO.

Type	Type of Line Facility	No. of Channels Per System	Type of Application
RTC-1/S	Open wire	1 to 4	Short-haul, stackable subscriber carrier; divided or bridged ringing.
RTC-1/T	Open wire	1 to 4	Short-haul trunk E & M or ringdown signalling.
AFC	Open wire	1 to 8 (duplex)	Telegraph-teletype or general. Telemetering functions can be used to replace composite signalling equipment.

STROMBERG-CARLSON CO.

Type	Type of Line Facility	No. of Channels Per System	Type of Application
S4-C	Open wire	1 to 4	Stackable; short and medium-haul.
S4-C30	Open wire	1 to 3	Short, medium and long-haul.
S12-0	Open wire	1 to 12	Stackable; short, medium and long-haul.
SMV-30	Radio	Up to 90 channels	Any radio equipment with suitable bandwidth.

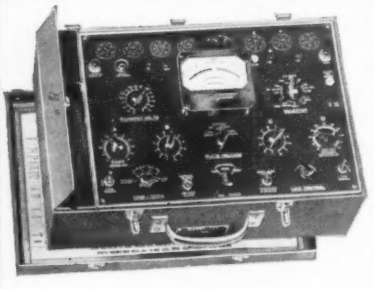
FOR *Clear* CHANNEL COMMUNICATIONS

WESTON Model 779 Type 5 ANALYZER

Telephone, carrier current and transmission line measurements are simplified with this compact Weston analyzer, which provides all normal a-c and d-c voltage, current and resistance ranges. Designed in cooperation with telephone and railway signal engineers, it gives readings to -20 dbm at carrier current frequencies and provides for both line bridging and line terminating. Temperature compensated, ungrounded, self-powered. For full details contact your Weston Representative, or write Weston Electrical Instrument Corporation, 617 Frelinghuysen Avenue, Newark 5, New Jersey . . . manufacturers of Weston and Tagliabue instruments.

Related Weston Instruments to Check Circuit Components

Model 697 Volt-Ohm Milliammeter combines a-c and d-c voltage, direct current, and resistance ranges. Self-contained battery. Sensitivity 1,000 ohms per volt.



Model 798 Proportional Mutual Conductance Tubechecker makes quick, accurate tests of receiving tubes, voltage regulator tubes, low power Thyratrons. Ranges 3,000/6,000/12,000 micromhos. Patented circuit uses differential frequency system.

Model 564 Volt-Ohmmeter provides a broad selection of resistance and d-c voltage ranges. Self-contained battery. Sensitivity 1,000 ohms per volt.

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EXPANDED POLYETHYLENE ON "VIDEO PAIR"

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New "video pair" manufactured by Western Electric for the Bell System uses cellular polyethylene on copper conductors, twisted together with two strands of fiber glass, also insulated with cellular polyethylene. A wrapping of polyethylene tape, two layers of copper tape, two wrappings of crepe paper and spiral wrappings of colored cord complete the assembly. The whole unit measures only ⅝ in. in diameter.

"Video pair" has a big job to do! The two slender copper wires carry impulses from camera to studio on remote pick-ups, and from studio to telephone central office for transmission via coaxial cable or radio relay.

Extruded insulation of cellular polyethylene now replaces the spiral plastic spacer and tape used on earlier models. The results—lower cost, superior transmission, and improved reception—all important to forthcoming color telecasts.

Cellular polyethylene consists of unconnected hollow cells. Its moisture resistance approaches that of solid polyethylene. It can be formed to about half the specific gravity of solid polyethylene, and provides reduced dielectric constant, lower line losses and lower costs for material.

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CHEERFULNESS IS CONTAGIOUS

Spread Cheer Through Your Voice

By G. R. BRACKETT

GOOD voice usage is recognized as an essential element in the use of the telephone. This article provides some suggestions for voice instruction, drill and guidance.

While we in the telephone industry do not consider ourselves teachers of elocution, we do know that a good telephone voice is becoming of greater importance in the business world than ever before and that we should do what we can to help develop this asset in our telephone users. Here are some suggestions on developing "good voice":

(1) There should be no intention to make all voices the same. Each person's voice is individual and should remain so. If the student's voice is expressive, pleasant and easy to understand, no attempt should be made to change her voice in tone or expression because it differs from some other voice.

(2) Our inner feelings determine to a great extent the impression made by our voices. Drills on enunciation and inflection will be largely wasted on a student who is not courteously responsive to the changing situations in which she talks over the telephone to customers or other employes.

(3) Over-emphasis reduces the force of an activity of this kind and may subject it to ridicule. Therefore, the instructor should avoid unnecessary exaggeration of enunciation and habitual attitudes or apology when not required. The prime requisites for good speech are naturalness, sincerity and appropriateness.

(4) PBX attendants are good object lessons for all telephone users. They are trained to be composed under fire. They are adept, past masters of the answer that turneth away wrath. Let's help keep them that way.

The instructor should analyze the voice usage of each student by listening to her as she talks to her about the instructions ahead, noting her diction and enunciation in ordinary conversation.

(1) ENUNCIATION.

(a)—Record the number of times the student is required to repeat an order, a word or a phrase because it is not understood.

(b)—Are certain sounds indistinct or is the poor enunciation general throughout conversation?

(c)—Observe speed. Is student speaking too rapidly or too slowly? When speech is too rapid, even though the enunciation is distinct, the customer at the other end of the line may have difficulty in understanding what is said. A dragging or drawling voice impairs clearness and wastes time.

(2) QUIET TONE.

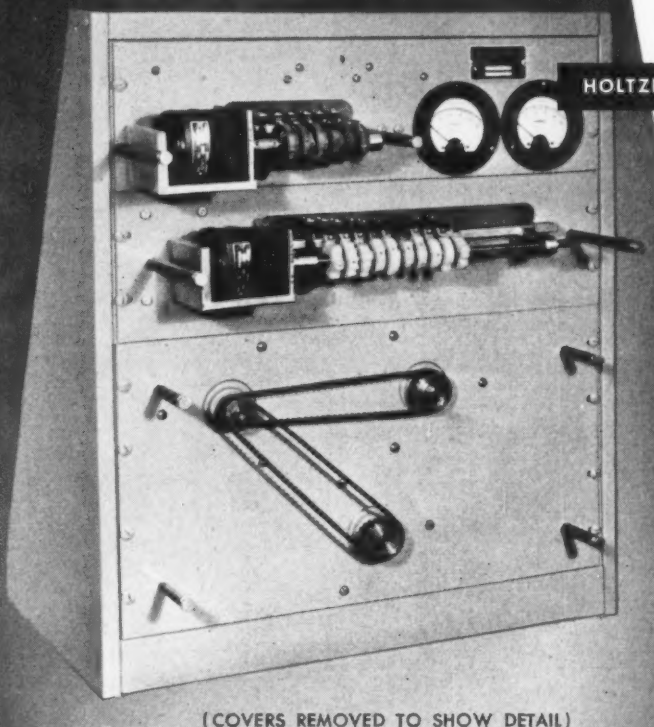
(a)—Can voice of the student be heard well enough to be understood at a point 3 feet from the telephone over which she is talking? If it can be heard, she is talking too loudly.

(b)—Is her transmitter adjusted properly? The top of the transmitter at the top of the lips and the outer edge of the transmitter at the center of the lips, adjusted one-half inch away from mouth? Remember, each additional one-half inch adds 1,200

Complete Ringing Power . . . In One Package!

MAKES INSTALLATION A SIMPLE WIRING JOB!

HOLTZER-CABOT TYPE 1A10P4 POWER PANEL



(COVERS REMOVED TO SHOW DETAIL)

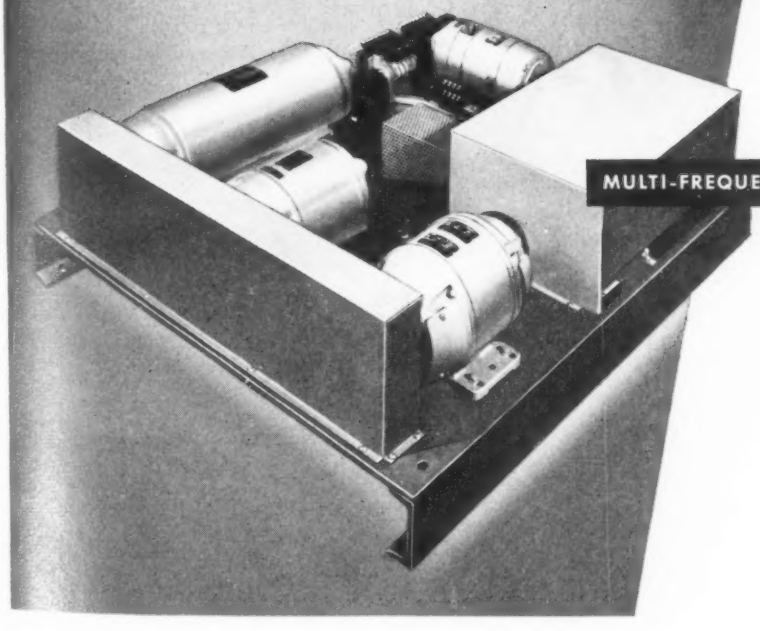
The moment you install this Holtzer-Cabot Power Panel you begin to save time and money. It combines *all* the essential components of power ringing equipment in *one compact unit* — and is ready to deliver long years of dependable operation!

You also get these cost-cutting features: — permanently sealed ball bearings; permanent magnet generators; nylon cams; ringing frequency of 20 cycles ± ⅓ cycle—which permits use of efficient high impedance ringers.

The flexible over-all design of this Holtzer-Cabot Power Panel makes it easy to incorporate special features. It is completely wired internally, with terminal boards for power input and output. Available fully assembled or on panels for standard power racks.

Type 1A10P4 Power Panel contains: battery voltage and amp meters; motor-driven interrupter; motor-driven timer; ringing generator; tone generator; dynamotor for stand-by operation from batteries; automatic relay switch for instant shift from AC to DC in case of line failure.

MULTI-FREQUENCY HARMONIC RINGING MOTOR GENERATOR SET



A complete, standard machine that meets the ringing requirements of selective party lines.

This set is available in ratings of 25, 50, 100 or 150 watts. Ringing frequencies are 16⅔, 25, 33⅓, 50 and 66⅔ cycles. Tone alternator-interrupter units produce approved dial tones of 500 cycles and 600/120 cycles for dial and busy tones. Set can be mounted vertically or horizontally.

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miles to the circuit over which she is talking.

(c)—Are there any contributing factors . . . working conditions, noisy rooms, poor transmission . . . which may be causing the student to talk too loudly?

(d)—Does the voice of the student usually have this much volume in ordinary conversation?

(3) COURTESY — PERSONAL INTEREST TONE—PLEASING TONE.

(a)—Is the student polite? Has she ability to choose the right word quickly? Has she the correct pronunciation of words—a good vocabulary?

(b)—Does she sound sincere and as if she is interested in what she is saying?

(c)—Does she supply the intended meaning to phrases by using emphasis and inflection in the proper places?

(d)—Does student use an exaggerated expression in attempting to appear courteous or interested?

(e)—Regardless of education, the ability to speak good English is easily attainable. By watching and listening to those who speak well and then practicing their delivery will be of good help. Once the student learns to choose the right word to convey her meaning, uses the right tone and inflection, irritation and misunderstandings will be negative.

Following are the factors in planning the necessary training:

(1)—Determine the features on which the student should be instructed. Take only one fault up at a time.

(2)—Determine in your own mind how instruction should be given.

(3)—Make an outline for each instruction. This outline need not be written but can be carried in the mind.

(4)—If possible, determine what is expected from the student on the job; should she operate a switchboard or answer a telephone, so that conclusions and remedies applied will be uniform and consistent.

The actual instruction should be conducted in an informal manner and conform to the principles of learning and teaching. The student should be informed that we are in no way attempting to teach her the art of public speaking but are merely showing her a short cut to good, understandable speech over the telephone. Here are some pointers:

(1)—The student should clearly know the features in which improvement is sought.

(2)—The feature should be thoroughly discussed with the student and a correct usage demonstration should be given by the instructor before starting the training routine.

(3)—The student should practice the correct employment of the feature under study until the instructor is reasonably sure the student understands its applications from all angles.

(4)—The instructor should be able to observe the application of the training she has given the student when she next visits her on the job.

(5)—The instructor should inform the student that correct speech is an important part of telephone service. She should maintain each student's interest by discussing with her each of her speech problems and keeping her informed of her improvement progress.

NEW RESPONSIBILITY

"Perhaps there was a day when management could tell the rest of the country—take it and like it—but if there ever was that day it is gone. Today we need from the business schools men who are willing to go beyond the offices of management out into the factories and beyond the factories' walls out into their communities, to play a role of leadership in community affairs that is co-operative and honest and who will sell the merits of private enterprise and American business both by what they do and what they say."
— SIDNEY A. SWENSRUD, *chairman of the board, Gulf Oil Co.*

THE ANSWERING PHRASE

Here are some suggestions on teaching "answering phrases":

"PBX Attendant"

"*Beryl* Hay Company."
"Beryl *Hay* Company."
"Beryl Hay *Company.*"
"*Beryl Hay Company.*"
(Italics mean emphasis.)

Have student determine which is best way to say answering phrase and have her repeat for improvement.

Instructor should listen for "Berlay Company." Watch for affected voice, sing-song, monotone—other than conversational tones.

* * * *

"Secretaries—Extension Users"

"*Mr. Cutting's telephone,* Miss Miller speaking."

"Mr. Cutting's telephone, *Miss Miller speaking.*"

"*Dr. Carney's office,* Miss Syrus speaking."

"Dr. Carney's office, *Miss Syrus speaking.*"

"*City Sales,* Kennedy speaking."

"City Sales, *Kennedy speaking.*"

Have student determine which is best way to say answering phrase and have her repeat for improvement.

Watch for affected voice, monotones, overtones.

On all answering practice phrases have student use name of company or department she will use on job.

* * * *

Following are some suggestions on acknowledging calls:

"PBX Attendant"

Getting a call off to a good start is important and gives the impression of alert, courteous, efficient service. When a calling party asks to be connected with an extension, person or department, he has no way of knowing that his request is understood . . . unless something is said to him in reply. Impress upon the student, acknowledgement should be one of her "Musts."

"*Thank* you."
"Thank *you.*"
"*Thank you.*"

If the calling party is recognized—"Certainly, Mr. Carson."

If the question is, "Will you please ring Mr. Lowe's telephone?" obviously, the answer should not be "Thank you." More likely—"Certainly." Or:

"Surely."

"I'll be glad to."

For additional information ask:

"Is that Mr. Stone of the sales department?"

"Is that Mr. M. C. Stone or Mr. O. M. Stone?"

If the caller's order was indefinite, a question regarding a billing, a desire to register a complaint or place an order, say:

"I'll connect you with our billing department."

"Mr. Craig takes care of that, I'll connect you with him."

"I will give you the order department."

On dial PBX's it might be well to say:

"I will connect you with the billing department, that extension is 378."

"That would be Mr. Hopson on extension 280."

"Thank you. The extension is 378."

* * * *

Secretaries—Extension Users"

"I am sorry, Mr. McClurg is not in his office but I expect him back in a short while. May I ask him to call you?"

"Mr. McLean is out of town. He won't be in his office until the first of the week. Perhaps I would be able to help you."

"No, Mr. George is not in his office just now. I'll be glad to locate him and have him call you."

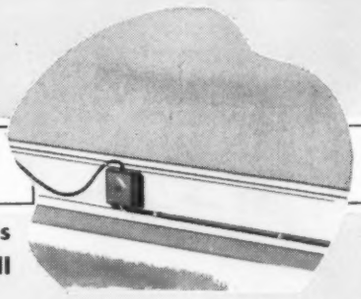
"Yes, Mr. Stevens is in, one moment, please."

"Mr. Hassett should be back in his office by 3 o'clock. Shall I have him call you or perhaps I could help you."

"Doctor Lucas has a patient now. Could I be of help?"

"Doctor Lucas is at the hospital this

(Please turn to page 82)



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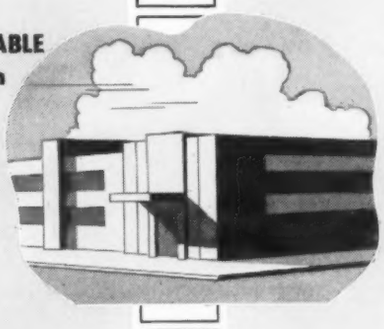

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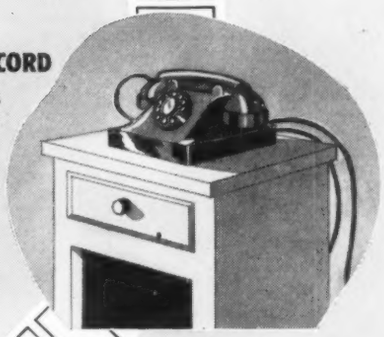

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TROUBLE CLEARING

Remarkable Progress Made in Power Plant

By L. N. MARTIN

THE PRACTICAL telephone man may not be interested in what might be called "ancient history," however, in the case of the power plant a brief review of its history will be of value at the present time. Some knowledge of what has gone before will enable the telephone man to better appreciate the many features of his modern power plant, or if he does not have all of the modern features, it will show him how he can not only reduce trouble but actually save money in the long run by modernizing his plant.

Also this history will show that each improvement in the power plant introduced new problems which had to be overcome in turn. The modern power plant is not yet perfect. We have recently encountered some serious trouble in modern fully automatic power plants.

When the common battery switchboard was first developed it was obvious that a reliable source of quiet dc power would be required. The lead-lead type of storage battery, which had been used by other industries for many years, was ideal for this purpose. Of course, the battery had to be recharged from time to time and this could not be done while the battery was in use because the generator would introduce an intolerable noise on all connections. Therefore two complete batteries were required. Also, since the generator could not come to the aid of the battery when the load was heavy, each of these batteries had to be much larger than would be used for the same plant today.

The maintenance routine was about at follows: Assuming that the No. 1 battery was in use, the No. 2 battery was charged and then left on open circuit. The specific gravity of the No. 1 battery was watched until the discharge had reached the lowest point that was still safe. The load was then shifted to the No. 2 battery and the No. 1 battery was recharged.

There are probably no plants of this type still in use. It was not such a bad system. The principal objection was the high first cost of two large batteries and possibly the large amount

PART 40. The preceding article in this series appeared in the August 28 issue, page 21.

of floor space which they occupied. On the other hand, the voltage was reasonably level as it could never be higher than the open circuit voltage and since each battery had a large capacity, the drop in voltage, caused by an ordinary load, was not serious. There were no complaints of "generator noise." During some of the years that followed we often wished that we had the old two-battery plant back again.

The next step was the one battery plant. The battery was charged while in use. This was made possible by the

(Please turn to page 58)

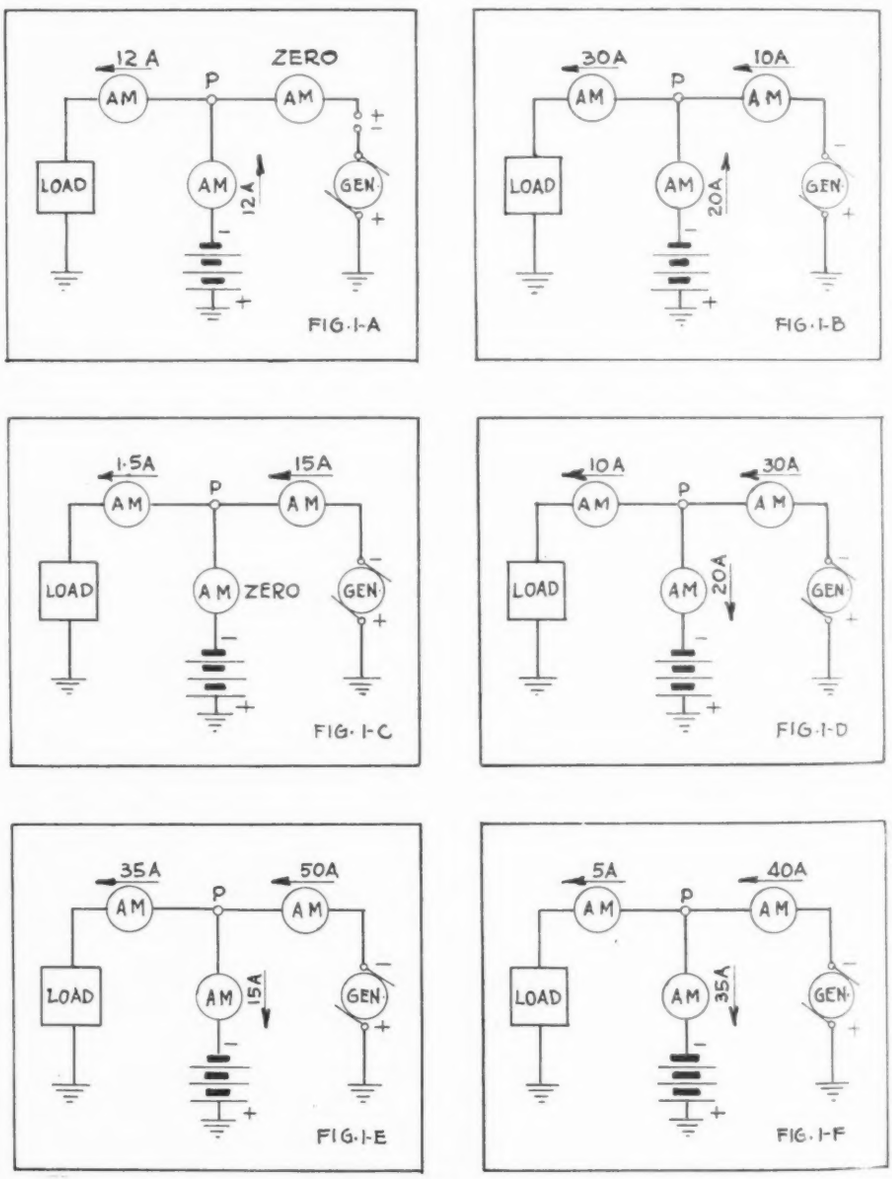
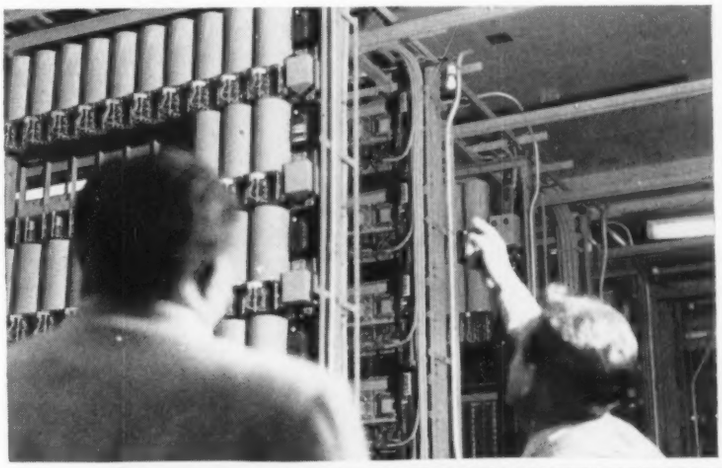
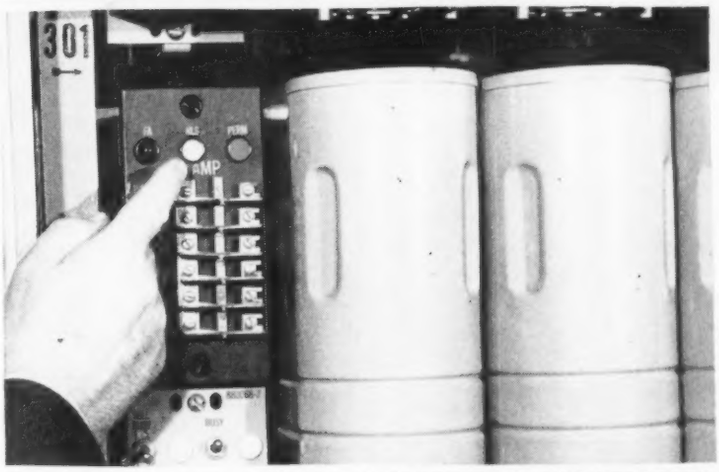


Fig. 1

Come with us as we visit a Strowger Automatic exchange. See for yourself how a typical corrective maintenance procedure progresses by swift, logical steps that save time, money, and make things right in a hurry:

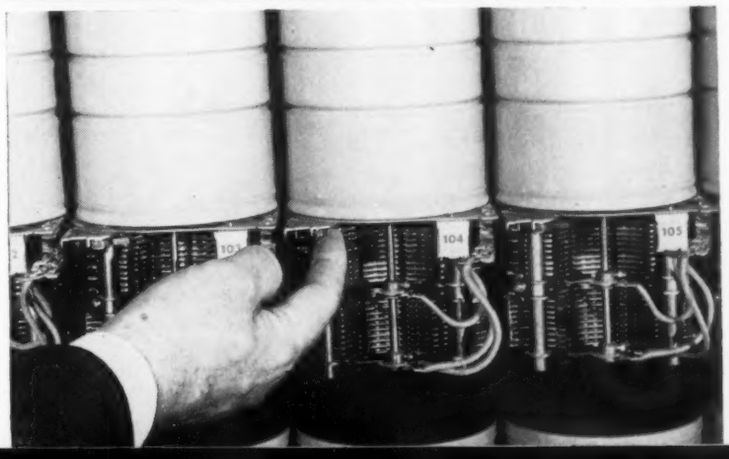


1. "Let's say a selector has not released to normal. A red lamp indicates the bay in which the affected switch is located."



2. "Another lamp indicates the shelf on which the affected switch is mounted. This switch must be one of those that is up."

3. "Listen at each 'up' switch with a test handset to find which is cut in on an idle circuit. Dialing indicates the specific nature of the trouble."



4. "Merely flip the red key to busy-out the affected switch so traffic will flow smoothly without interference. You can attend to this switch now—or later, if that is more convenient."

development of a new type of dc generator, made especially for telephone company use. The new generator had many more windings on its armature than a conventional generator and hence many narrow segments on its commutator. This reduced the "flutter" as the brushes passed from bar to bar. Also the carbon brushes were replaced by brushes made of brass gauze. Carbon is a natural arcing material (witness its use in the arc light) and the new brass gauze brushes greatly reduced the arcing between the brushes and the commutator.

However, the new generator was somewhat temperamental. Its commutator had to be maintained "just so" or the brushes would arc and cause noise. The power man spent many hours oiling and polishing the commutator.

Next came the filter which eliminated all generator noise. The electrical filter is now so well known and is used for so many purposes in telephone and radio work that it is hard to realize that only a few years ago it was unknown. The power plant filter is designed to suppress all ac components and to allow only quiet dc to pass; therefore, it is a very simple affair. It consists of an inductance coil which has a high reactance but a very low resistance and which is connected in series with the charging lead. Also a condenser of high capacity is bridged across the battery. The electrolytic condenser was developed for this purpose. It looks much like a storage cell but requires almost no maintenance. It has a capacity of 100 MF and up.

The use of the filter enabled telephone companies to go back to the more satisfactory conventional generator or "commercial type generator" as it was called and the special telephone generator has now about disappeared from the scene. Various types of rectifiers could now be used for small offices and for light loads in large offices. These also require filters, but the filter is usually built into the rectifier unit.

The circuit of the one battery power plant is very simple but some may have difficulty in visualizing it. In Figs. 1-A to 1-F we show the circuit in simplified form. Notice that the negative pole of the battery, the negative pole of the generator, and the negative end of the load are all connected together at some common point "P." The positive poles are all connected to ground or, in other words, to another common point.

We show three ammeters but, in actual practice, the meter in the load circuit is usually omitted. If there is more than one generator or rectifier, each has its own ammeter. In the case of the rectifier, the meter is usually a part of the rectifier. The battery ammeter is a "zero center" meter as the current may flow in either direction. The other meters are "zero side."

The arrows show the direction of the current under various conditions (assuming that the current flows from negative to positive) and the figures adjacent to the arrows indicate amperes.

In *Fig. 1-A*, the load is 12 amperes all of which is furnished by the battery. The generator is not running and is disconnected at point "x" which is a switch or a circuit breaker.

In *Fig 1-B*, the generator is assisting the battery in carrying the load. The load is 30 amperes, of which 20 are furnished by the battery and 10 by the generator.

In *Fig. 1-C*, the battery is "floating." The load is 15 amperes and the output of the generator is 15 amperes, therefore, no current flows into or out of the battery. Floating by manual adjustment would require the full time of a powerman who would have to keep an eye on the meter and a hand on the rheostat. Automatic equipment keeps the output of the generator equal to the load at all times. However, as we will show later, automatic floating is never quite perfect.

In *Fig. 1-D*, the generator is carrying the load and at the same time is charging the battery at its normal charging rate which in this case is 20 amperes. As the load is 10 amperes, the generator must put out 30 amperes. Automatic charging equipment will maintain the 20-ampere charge with a varying load. Without automatic charging equipment the output of the generator must be adjusted every few minutes.

In *Fig. 1-E*, an attempt is being made to charge the battery at its rated 20 amperes. However the load is 35 amperes and the generator has a capacity of only 50 amperes, therefore, the battery receives only 15 amperes. *To be able to charge the battery at its normal charging rate the generators and/or rectifiers must have a total capacity equal to the normal charging rate of the battery plus the load.*

Fig. 1-F shows what may happen with a hand regulated charge. The battery was charging at the normal rate when the load suddenly dropped to only 5 amperes. The setting of the generator caused an excessive current (35 amperes) to flow through the battery. This would not happen with automatic charging control.

The battery routine with the one-battery, manually operated plant was about as follows: At 8 a.m. (except possibly on Sunday), the power man read the specific gravity of the pilot cell to see how low the battery had fallen during the night and this enabled him to estimate how long he would have to charge. He then started the generator and adjusted its output so that it would carry the load and, at the same time, put the normal charging rate into the battery. He had to correct this adjustment at least every half hour during the charge. Unless the plant included a filter he probably spent the rest of his time taking care of the commutator and brushes. The battery was usually "up" sometime between 11 a.m. and 2 p.m. Towards the latter part of the charge, he read the specific gravity of the pilot cell at frequent intervals.

Saturday was "overcharge" day. (Now called "equalizing charge.") This required all day and sometimes more. (In those days overtime was not paid for at time and a half if paid for at all.) This prolonged charge once per week was thought to be necessary to keep the battery in good condition and to establish a new "full charge" specific gravity reading for use during the following week.

It is evident that this system called for excessive maintenance man-hours. It also caused an excessive variation in voltage. Not only was there a drop in voltage when the load increased while the generator was not running, but there was an increase in voltage during the charging period. The voltage of a 11-cell plant often ranged from 18 volts to 28 volts making relay maintenance "impossible."

It seems strange that even the larger companies did not realize the cause of the excessive relay trouble. We have seen the same relays adjusted twice a day, day after day, when the real trouble was the variation in voltage.

This condition existed entirely too long but ultimately steps were taken to correct it. Various schemes were devised for more or less automatic charging. One of the best used an ampere-hour meter to measure the ampere-hours taken out of the battery. The charge was started manually and the meter then ran backwards. An ingenious device caused it to run slower when running backward so as to allow a percentage for battery losses. When the meter got back to zero it made a contact which stopped the generator. This relieved the powerman of much time spent in watching the progress of the charge.

For a small battery with a reasonably constant load, the "trickle charge" can be used. If the approximate ampere-hour consumption during some in-

(Please turn to page 83)

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ABC of the Telephone

By FRANK E. LEE

THE AIRLINE system of wiring diagrams has certain features that are similar to the highway system previously discussed.

(1) The apparatus is arranged on the diagram in approximately the same position that it appears on the equipment frame.

(2) Feed lines are used between the apparatus and a base line to represent the individual wires in a particular circuit. The color of the wire is shown on the feed line in the same manner as on the highway diagram.

PART 72—SECTION IX. Central office maintenance—how to read circuit drawings (airline system of wiring diagrams). The preceding article in this series appeared in the Aug. 21 issue, page 19.

Although the rest of the features on an airline diagram have some similarity to a highway diagram, it is best to consider them individually.

On an airline drawing the feed lines terminate at base lines. Actually the base lines have no meaning whatsoever. They serve merely as a convenient terminating point for the feed lines, and they also provide a method of separating the various parts of the diagram. For these reasons, the base

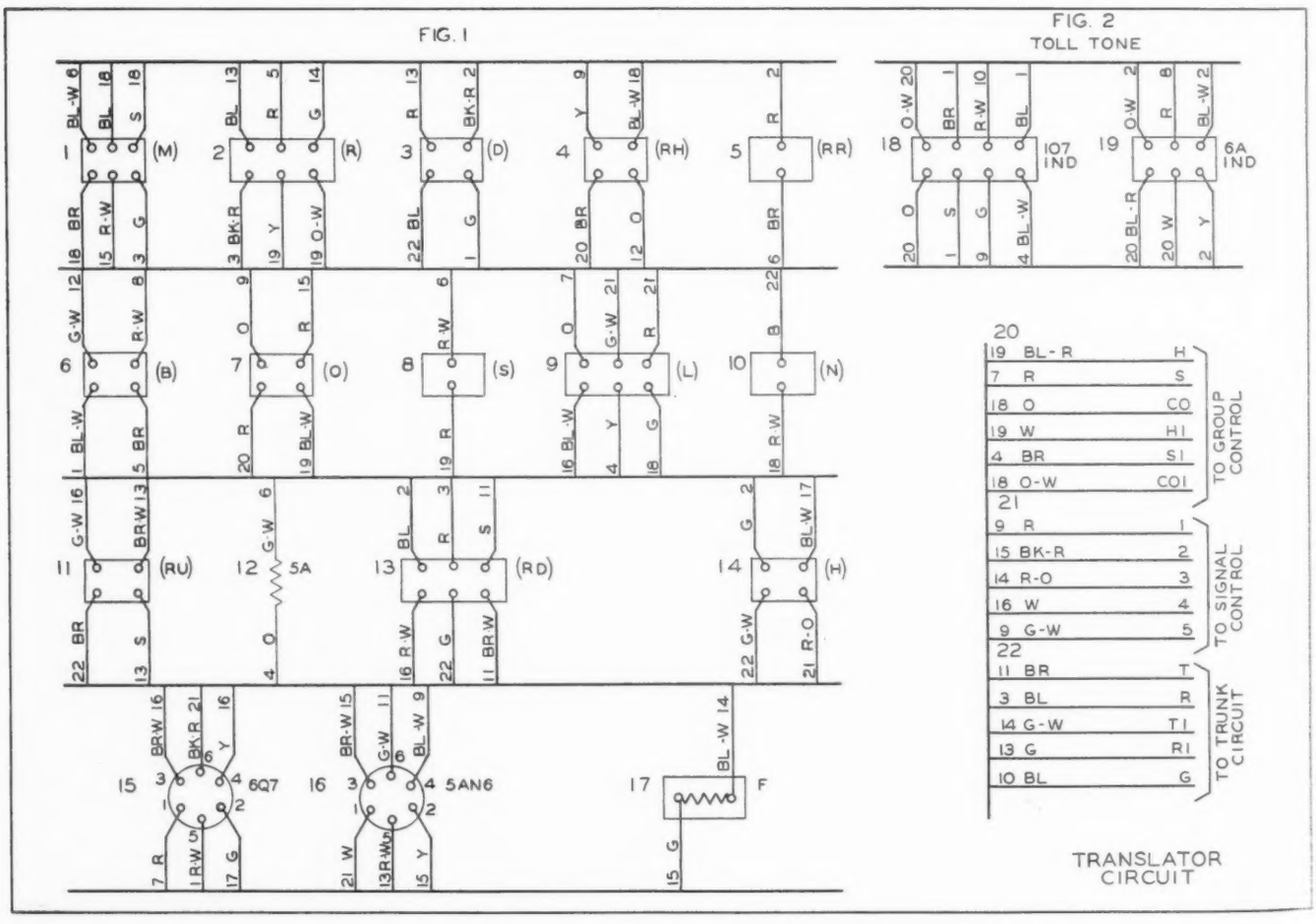

Fig. 1

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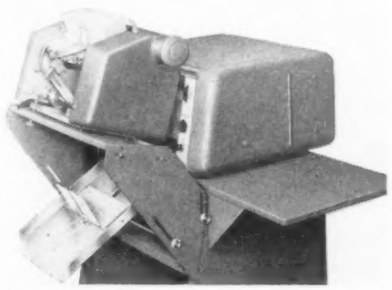

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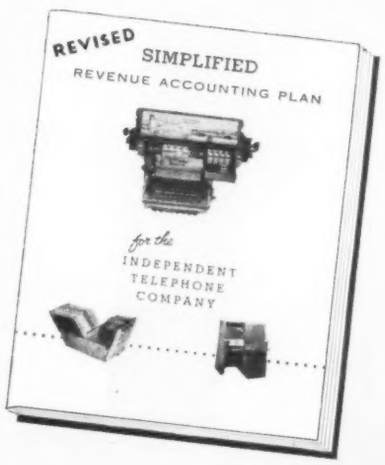

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lines are drawn with the same weight line as used for the feed lines.

From a study of the typical airline diagram shown in *Fig. 1*, it will be noted that each piece of apparatus is identified with a number. As a rule, these numbers are assigned in numerical sequence reading from left to right from the top of the diagram to the bottom. Although not shown in *Fig. 1*, miscellaneous apparatus such as terminal punchings, cord terminals, and related items are not assigned individual identification numbers. Instead they are grouped together by a bracket and each bracket is assigned an identification number.

The only significance of the number assigned to a piece of apparatus on an airline diagram is that the number assists in locating the particular piece of apparatus while using the diagram.

Another significant fact about airline diagrams is that the feed lines approach the base lines at a 90° angle. Thus, there is no intention of indicating direction of travel from an originating point to a terminating point.

The feed lines are numbered at the base line to indicate the apparatus or bracket where the other end of the feed line is terminated. At the originating end this number will be the number of the apparatus at the terminating end. At the terminating end of the line this number will be the number of the originating end.

As a result, the color of the wire, as shown on the feed line, becomes significant along with the apparatus number when tracing connections on an airline diagram. If wires of the same color are extended between the same two pieces of apparatus, the wires will be identified with additional markings.

Airline diagrams are read in the following manner:

(1) Start at any terminal punching and follow the feed line to the base line.

(2) Note the color of wire shown on the feed line and the number of the apparatus unit at which the other end of the wire terminates. Also, keep in mind the number of the apparatus at the starting point.

(3) Move directly to the apparatus number at the terminating end. (This is why these diagrams are called airline diagrams.)

(4) Locate the feed line identified with the originating end number. The wire color also should agree. Trace this feed line to the terminating point of the wire.

A wire that extends from one drawing to another will appear on a feed line which terminates at a bracket. The bracket will be marked to identify the associated drawing. Also, as a rule, the feed line will be marked at the bracket the same as it is marked on the related diagram.

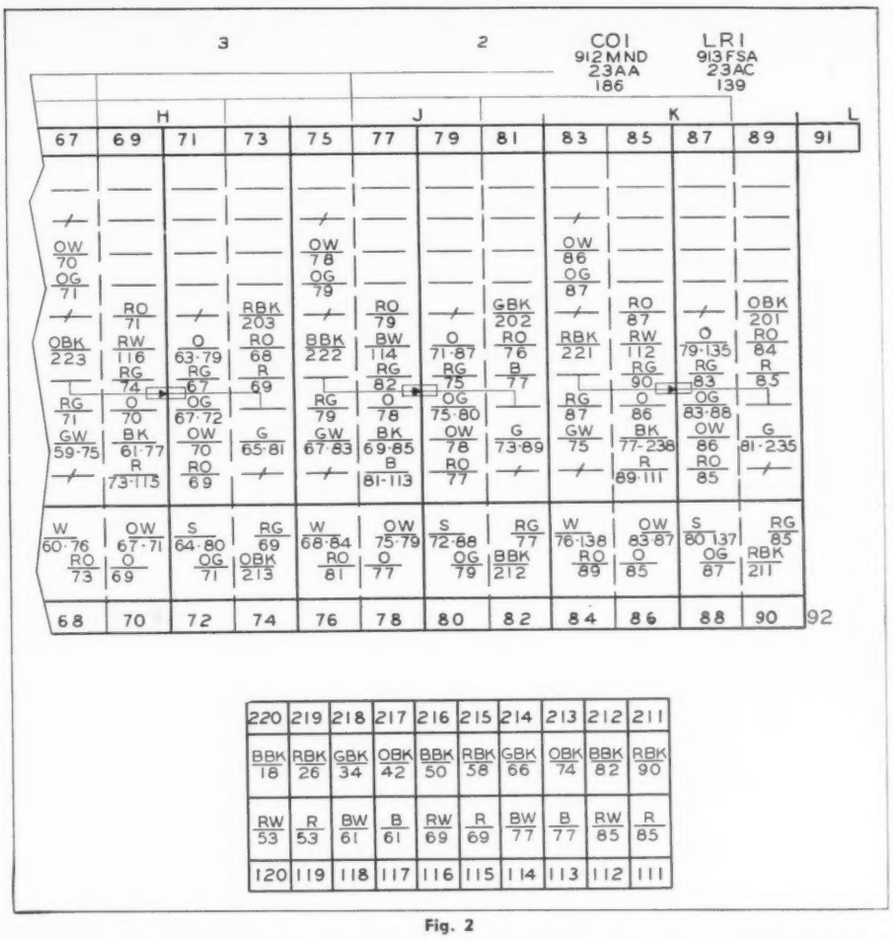

Fig. 2

Following are instructions as to how to trace circuits on an airline diagram (See *Fig. 1*):

(1) Connection originates and terminates on same figure. For this example: Start at relay O, identification number 7, upper right contact where a feed line is marked R (red) 15. From this base line go directly to identification number 15 which is the 6Q7 vacuum tube. Between punching 1 of the tube and the base line is a feed line designated R-7. This designation marks a red lead from identification number 7 from which this example started.

Once the system of an airline drawing is understood the tracing process in the above example might be reduced to the following:

(a) From No. 7 go to 15 R-7.

(b) At No. 15 look for R-7.

(2) Connection originates on one figure and terminates on another figure on the same diagram.

Locate a feed line designated R-W (Red-White) 18 at identification No. 10 which is capacitor (N). Jump to a feed line designated R-W 10 at identification No. 18. This feed line terminates on the second contact from the right of inductor 107. The rapid tracing pattern in this example would be:

(a) From No. 10 go to 18-R-W-10.

(b) At No. 18 look for R-W-10.

(3) Connection originates on one diagram and terminates on another.

Start at a feed line designated BL (Blue) 22 at identification No. 3. Jump directly to identification No. 22 and locate a feed line marked BL-3. This feed line is designated R at the point where it terminates at a bracket labelled "To Trunk Circuit."

On the trunk circuit diagram the connection traced above will be marked R and will be located in a bracket labelled "To translator circuit." From that point it could be traced to its ultimate destination.

Checking further at identification No. 22, it will be noted there are two blue feed lines—one designated BL-3 and the other BL-10. The connection being traced in this example started at identification No. 3. Therefore, feed line BL-10 is disregarded at this time and the connection is traced over feed line BL-3.

Reference Designation Drawings

As discussed previously, the primary purpose of any wiring diagram is to show where the various wires in a circuit are terminated. In the highway and airline systems only a short section of each wire was shown. The intermediate portions of these wires were eliminated to make the drawings easier to use.

Reference designation drawings eliminate all the actual wires. Instead the wires are identified by color designation and information where the other end (or ends) of the wire is terminated.

At first glance, the reference desig-

Coming up!

OCTOBER 11, 12, 13

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nation wiring drawing may appear to carry simplification too far. However, after a brief study this method is as easy to understand and use as any that have been discussed. A section of a typical reference designation drawing is shown in *Fig. 2*.

All designations of relays or other wiring units are shown on the drawing exactly as they are stamped on the apparatus. For example, a designation LRI, for line relay 1, will be found in the upper right hand corner of *Fig. 2*.

Directly below the relay designation is the code number of the relay, 913 FSA, 23 AC, 139. Next the numbers 87 and 89 are shown at the head of separate columns below the relay designation. Also, it will be noted the numbers 88 and 90 are shown in the same columns at the bottom of the drawing. Each vertical column represents a stitch of the relay bar cable form where the wires leading to the relay springs and winding terminals leave the laced leg of the cable form. *Fig. 3* shows how the wires are laced together with linen twine to form the wiring cable. The twine is tied by evenly spaced lock stitches which hold the cable securely.

In the initial stages of wiring the equipment the individual wires are laid together on a wiring form or jig on which nails or holes are provided for the wires in each stitch. The form or jig corresponds in size to the actual equipment. Therefore, when all the wires have been placed and lock stitched with the twine, the completed cable can be removed from the form and connected to the equipment.

As shown in *Fig. 2*, two stitches are used for each relay. For example, the two vertical columns 87 and 89 are for the two spring-piles of line relay 1. The lower sections of these same columns numbered 88 and 90, show the wires for the winding terminals of the same relay, which are in the same stitch as 87 and 89, but on the opposite side. In a similar manner, vertical columns 83 and 85 are used for cutoff relay 1.

The vertical columns in the center of the drawing, numbered 75 and 77 are for the spring-piles of cut-off relay 2. Similarly, the vertical columns 79 and 81 are for the spring-piles of line relay 2. In a like manner, columns 67, 69, 71 and 73 are for cutoff relay 3 and line relay 3.

Horizontal guide lines at the top of the drawing assist in designating the columns associated with the various line relays or cutoff relays in the circuit. The lower horizontal guide line has vertical marks which are located between the two columns associated

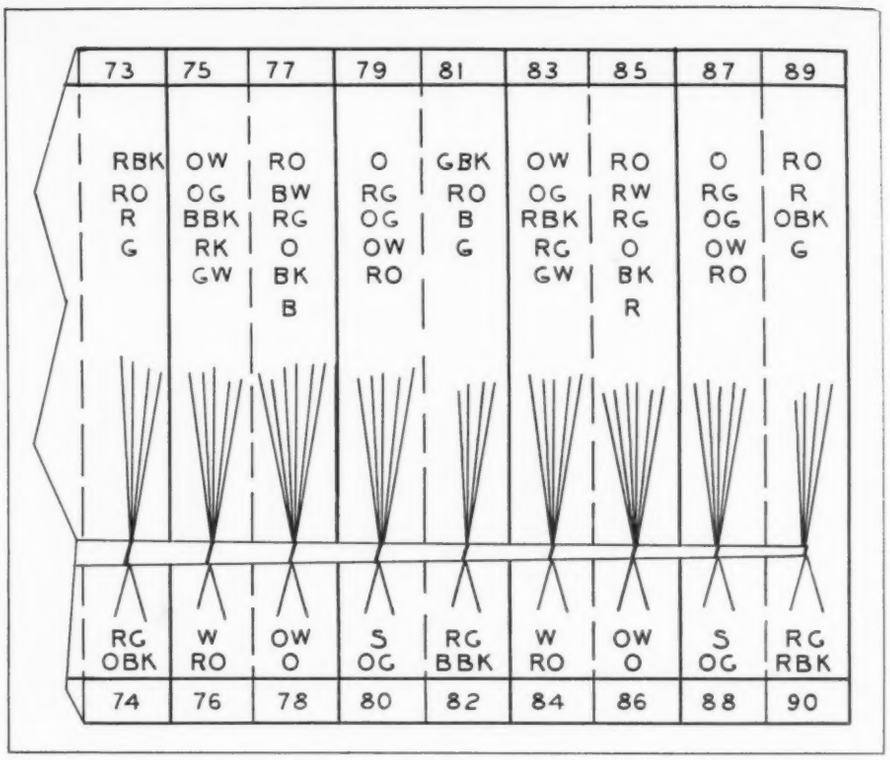

73 75 77 79 81 83 85 87 89
RBK RO R G
OW OG BBK RK GW
RO BW RG O BK B
O RG OG OW RO
GBK RO B G
OW OG RBK RG GW
RO RW RG O BK R
O RG OG OW RO
RO R OBK G
RG OBK
W RO
OW O
S OG
RG BBK
W RO
OW O
S OG
RG RBK
74 76 78 80 82 84 86 88 90

Fig. 3

with each of the line relays. In a like manner, the upper horizontal guide line with its vertical marks is associated with the cutoff relays.

The information shown in *Fig. 2* is only a portion of the original drawing which also included cutoff and line relays 4, 5, 6, 7, 8, 9, and 0. In this circuit the "O" relays are placed after the "9" relays whereas in some other systems the "0" relays may precede the "1" relays.

Referring again to *Fig. 2*, it will be noted that a heavy line is used to separate the designations of the wires used for the spring-piles from the designations of the wires used for the winding terminals.

The short horizontal lines in each vertical column represent the solder lugs of relay contact springs or of winding terminals. The contact springs are numbered from the bottom up. As a general rule, the numbers 1-9 are for the left-hand spring-pile, as seen from the front of the relay, and numbers 11-19 are for the right-hand spring-pile. The short diagonal line through a contact spring designation indicates an unequipped spring position. Only equipped spring positions are included when the springs in the various spring piles are counted. For example, in column 89 the No. 1 spring of the LRI relay is the second spring above the heavy horizontal line that divides the lower winding portion of the column. In column 85 the No. 1 spring of the COI relay is the first spring above the heavy dividing line.

On this particular drawing the winding terminals are numbered from 1 to 4, starting with the top winding spring in the higher numbered column and moving in a clockwise direction to the top winding spring in the lower numbered column. For example, the winding terminals of relay LRI are as follows:

Terminal	*Marking on drawing*
1	RG/85
2	RBK/211
3	OG/87
4	S/80-137

The wire that terminates on each relay spring is identified by the color abbreviation that appears above the line. The number below the column indicates the spring or springs to which the other end or ends of the wire is terminated.

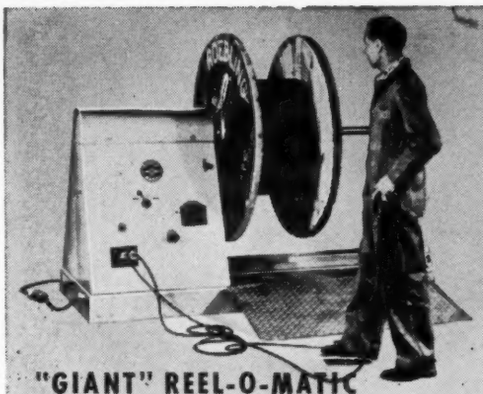
The following color abbreviations are commonly accepted:

R—Red
B—Blue
O—Orange
G—Green
BR—Brown
S—Slate
W—White
BK—Black

Where a wire is identified by two or more colors the abbreviation would appear as follows:

RW—Red-White
RBK—Red-Black
RS—Red-Slate

(Please turn to page 66)



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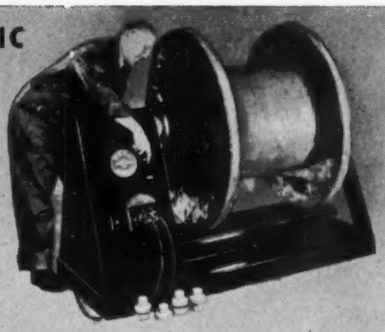

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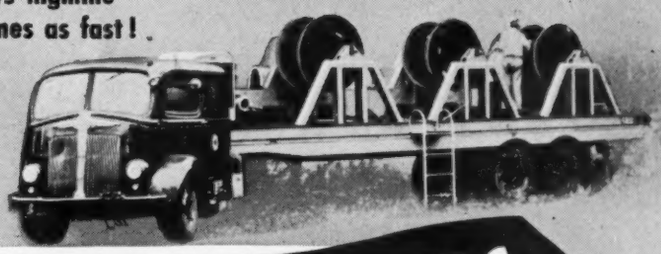

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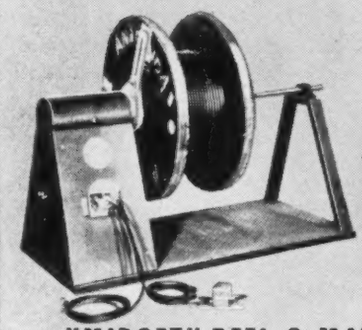

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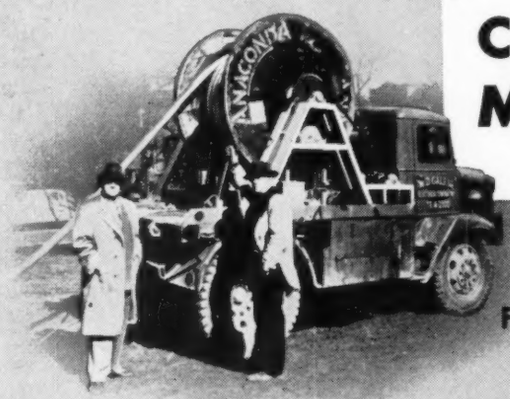

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Thus, a typical list of color codes that may be used is:

R	RW	RBK	RG	RO	RB
B	BW	BBK	BG	BO	
O	OW	OBK	OG		
G	GW	GBK			
BR	BRW				
S					

The top spring in column 77 is marked RO/79 which means that a Red-Orange wire is placed between this particular spring and a spring in column 79 which is marked RO/77.

A wire may also connect three or more wiring terminals. For example, an OW (Orange-White) wire starts in column 67, goes to column 70 and from there to column 71. In a similar manner a common wire may extend to certain terminals on a whole series of relays or other items of equipment.

The lower portion of *Fig. 2* illustrates how separate portions of the circuit are wired into the principal components. In this instance the vertical columns or stitches numbered 111 to 120 and 211 to 220 indicate springs of a relay bar jack used for jacking or connecting this particular unit of equipment into the equipment bay.

Occasionally, a strap or other component of the circuit may be placed between two relay or winding springs without being included in the cable wiring form. In *Fig. 2* a cartridge rectifier is connected between the No. 13 spring of the CO relay and the No. 2 spring of the associated LR relay.

(To Be Continued)

V V

"[To switch from a war economy] to one based primarily on peacetime conditions is not easy. It entails the best that is in all of us, and it entails sacrifice by some."—JOSEPH W. MARTIN, JR., Speaker, U.S. House of Representatives.

THE INDEPENDENT
TELEPHONE PIONEER ASSOCIATION

Memo to: You

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Cordially Invited to Hear
The Notre Dame Glee Club
date - Oct. 12 time - 2 p.m.
place - Grand Ballroom,
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Be Our Guests!
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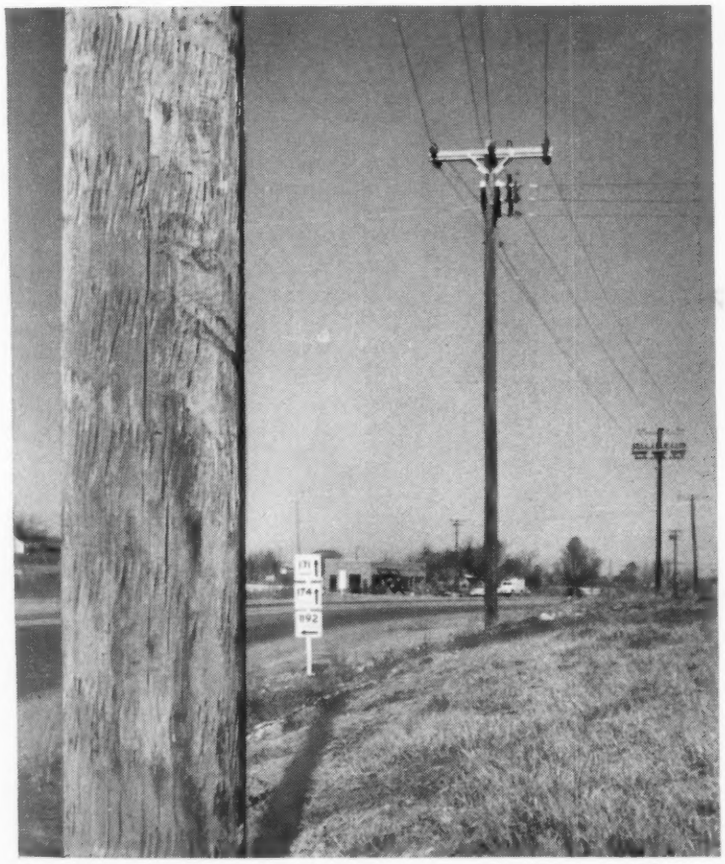

Penta pressure-treated southern pine poles.

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☐ Send me free information on Penta-treated poles and crossarms.

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PENTA lengthens the service life of poles and crossarms by providing positive protection against decay and termites. Linemen, too, like to work with *clean* poles.

Over 60 suppliers across the country can furnish you with PENTA-treated poles. Ask your regular supplier about *PENTAchlorophenol, or write THE DOW CHEMICAL COMPANY, Midland, Michigan.

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TERMINALS FOR PLASTIC COVERED CABLE WITH

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THE NEW COOK

P-L-X

CABLE TERMINAL

This new telephone terminal is simple to install and designed for maintenance free operation. Heavy galvanized steel frame and deep drawn chamber, welded zinc cover and the famous XB Bakelite face plate with Everdur studs comprise the major feature of this new Plastic Loop Unprotected Pole Cable Terminal. The front of the unit opens down for the working convenience. No stubbing, no splicing, no potting makes it better, simpler, and economical too.

Supplied in 6, 11, 16, and 26 pair.

THE COOK

S-20 V

CABLE TERMINAL

Every possible feature of accessibility and convenience has been carefully engineered in designing the S-20 V Pole Cable Terminal and Protector Mounting which is in wide use as a protected or unprotected all steel cable terminal. This new Terminal when used with plastic cable is manufactured with two cable entrances, each of which is arranged to take any size of compression coupling from 6 pair to 51 pair. When only one cable entrance is required, a standard pipe plug can be inserted to close the other entrance.

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COURTS AND COMMISSIONS

Rate Raises for Dial Service Granted Minnesota Company

The Runestone Telephone Association, Barrett, on Sept. 13 was authorized rate raises conditioned upon cutover to automatic operation at its Kensington and Donnelly exchanges by the Minnesota Railroad & Warehouse Commission.

Under the present rates, the company's four exchanges are operating at a net deficit of $6,967 on gross revenues of $29,251. After conversion of the Kensington and Donnelly exchanges to automatic operation and, under the approved rates, operating revenues will be $80,287, with net income of $20,638 —a return of 3.60 per cent on a new, original cost of plant of $573,021.

The following is the approved schedule of dial rates:

One-party business	$6.00
Two-party business	4.75
Rural multi-party business	5.00
One-party residence	4.50
Two-party residence	4.00
Four-party residence	3.50
Rural multi-party residence	3.75
Mileage charge for service beyond the local base rate area, each ⅛ mile or fraction thereof:	
One-party	.30
Two-party, each subscriber	.20
Four-party, each subscriber	.15

From its Kensington and Donnelly exchanges, the company serves about 145 local and 215 rural stations; from its other two, Hoffman and Barrett, about 219 local and 260 rural stations.

V V

General of Indiana Petitions For Increase in Rates

Officials of General Telephone Co. of Indiana, Inc., Lafayette, on Sept. 16 filed a petition with the Indiana Public Service Commission seeking authority to increase rates and charges. The petition stated that additional revenues are required to offset the increased costs of materials and taxes.

The petition did not request a specific amount, but asked for a rate schedule which would be just, reasonable and sufficient to pay all necessary operating expenses, service its bonded indebtedness, pay dividends upon its preferred and common stock, and maintain a sound financial structure permitting the company to secure the additional financing necessary for future expansion and improvement.

The company is operating and fur-

nishing telephone service under rates approved by the commission in 1952. Since that time, the company has continued to expand its plant and facilities to meet the demand for telephone service, and has pursued an aggressive program of rehabilitation in its exchanges. During the period from July 1, 1952, to July 31, 1954, the company's investment in net telephone plant has increased by approximately 4 million dollars, and total capitalization has increased by about the same amount. During this period, the company has had a net increase in telephones in service of more than 12,000, and has converted many of its small magneto exchanges to automatic dial operation.

V V

General of Southwest Secures More Rate Increases in Texas

General Telephone Co. of the Southwest, San Angelo, Tex., obtained rate increases in August at the following Texas exchanges:

Exchange	*Old*	*New*
Petersburg:		
Dial, 428 stations; effective 9/6/54.		
One-party business	$6.50	$8.00
Two-party business	5.00	6.25
One-party residence	3.75	4.75
Two-party residence	3.00	3.75
Eldorado:		
Dial, 820 stations; effective 8/21/54.		
One-party business	5.25	8.25
Two-party business	4.25	7.25
One-party residence	3.00	4.25
Two-party residence	2.50	4.00
Four-party residence	2.25	3.75
Robstown:		
Dial, 2,153 stations; effective 9/16/54.		
One-party business	9.50	12.25
Two-party business	8.00	9.50
One-party residence	4.75	6.00
Two-party residence	4.00	5.00
Four-party residence	3.25	4.25
Trinity:		
Common Battery, 804 stations; effective 9/1/54.		
One-party business	5.00	6.75
Two-party business	4.25	5.25
One-party residence	3.00	4.00
Two-party residence	2.50	3.25
Anton:		
Dial, 340 stations; effective 9/1/54.		
One-party business	6.50	8.50
Two-party business	5.00	6.50
One-party residence	3.75	4.50
Two-party residence	3.00	3.75

At the end of August there were 26 cases filed with cities in Texas, representing an annual increase in revenues of $708,367; a case filed with the Oklahoma Corporation Commission representing an increase of $157,400, and a case filed with the Arkansas Public Service Commission representing an annual increase of $302,231—the total for all 28 cases being $1,167,998.00.

To date this year, General Telephone Co. of the Southwest has completed 29 rate cases totaling an annual increase in revenue of $354,331.

New . . . Different . . . Better

COFFING

Super Power

COIL CHAIN

RATCHET LEVER HOIST

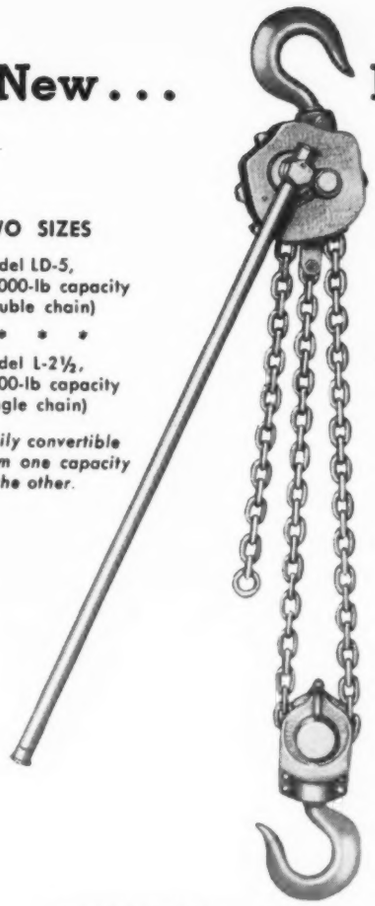
TWO SIZES

Model LD-5, 10,000-lb capacity (double chain)

* * *

Model L-2½, 5,000-lb capacity (single chain)

Easily convertible from one capacity to the other.



For over two years the entire production of Coffing's new Super Power Ratchet Lever Hoist has gone into military service. Now it is available to bring new standards of ratchet hoist performance to civilian users. These are just a few of the advantages this new hoist offers:

SIMPLE in design

Parts are simple, rugged and few in number to assure continued top performance. May be disassembled in the field for fast, efficient servicing.

The only 5-ton hoist of this type using but two chains, contributing to faster operation and lighter weight.

CONVENIENT to use

Handle adjustable for close-quarter applications — also may be operated from opposite side of hoist.

The 5-ton model weighs but 58 lb — lightest weight ratchet hoist in this capacity on the market.

Only 70 lb of handle pull needed to lift 10,000 lb with patented compound lever principle.

You get coil chain flexibility plus free chaining for quick adjustment.

TOUGH for safety and dependability

Ratchets and pawls are specially hardened alloy steel — *every* load-holding ratchet is tested at 30,000 lb.

Housing is certified malleable iron to protect hoist from rust and damage.

Handle is designed to bend before hoist is overloaded beyond safe limits.

For full details, write for Bulletin T9L.

IN PUNISHING "DROP TEST," the Super Power had to withstand the shock of a 10,000-lb load dropped 4 in.— *an impact load of over* 40,000 *lb.* After several hundred such tests of Super Powers, there has never been a hoist failure!

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Build lines to stay with the

CHANCE 8 Way

Here's a typical example of a test result . . . This 200 square inch Chance 8-Way was pulled to nearly double its rated load without damage to the anchor.

MIKE'S RIGHT! You can't tell what happens to an anchor after it's installed unless it fails—or is pulled out in a test or dug out for examination. Chance has pull-tested all kinds of anchors all over the country to see what happens when anchors are subjected to heavy loads. These tests prove that the Chance 8-Way holds far more than its rated load because the eight blades expand to form a complete pyramid shaped square—there is no wasted space between blades. The guy load is equally distributed all around the hole.

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8-Ways are available in a range of sizes for every requirement from guying rural phone lines to guying heavy transmission lines. Your CHANCE Anchor Distributor can probably supply you directly from stock. SPECIFY CHANCE FOR SERVICE!

A·B·CHANCE CO·

CENTRALIA, MISSOURI
SAN FRANCISCO, CALIFORNIA

ABC Industries

CA54-4A

General of Illinois Registers Preferred with SEC

General Telephone Co. of Illinois, Springfield, has put 82,000 preferred shares into registration with the Securities & Exchange Commission, it was reported on Sept. 15.

The $2.375 cumulative preferred, no par, will be offered publicly through underwriters principally by Paine, Webber, Jackson & Curtis; Stone & Webster, Securities Corp., and Mitchum, Tully & Co. The General of Illinois will pay off bank loans and reimburse its parent, General Telephone Corp., with the proceeds.

CONFERENCES FEATURE

Concluded from page 27

has secured the services of another member who is completing his first year with the committee. Speaking on a subject involving new and improved training methods in the traffic department, comes Herman Kleinhammer, from the Intermountain Telephone Co. of Bristol, Tenn. Mr. Kleinhammer is known to be a hard worker and thoroughly experienced in his subject and we know that he will come up with a presentation that will be of interest to all.

Rounding out the two-hour program will be the chairman's report to the USITA board of directors. This report will cover happenings in the industry during the past year, pointing out items of progress and present as fully as possible goings-on in matters traffic.

The Traffic Committee wishes to extend a special invitation to the operating heads of Independent telephone companies throughout the nation to attend the Traffic Conference and we feel that we can assure them a program which will be well worth their time and attention.

V V

OK Three Nebraska Certificates

Three telephone companies were issued certificates of convenience and necessity by the Nebraska Railway Commission on August 20. The certificates will permit extension of telephone lines into a portion of the territory served by the Shell Creek Mutual Telephone Co., Petersburg, Neb. The three companies are the Closter Cooperative Telephone Co., Albion; Petersburg Telephone Co., and Nebraska Continental Telephone Co., Columbus.

V V

Impatience never commanded success.—CHAPIN.

LYNCH

Three telephone engineers comment on....

B-112

the most useful.... low cost..multi-purpose repeater available to the industry

Mr. "X" uses it . . . . . .

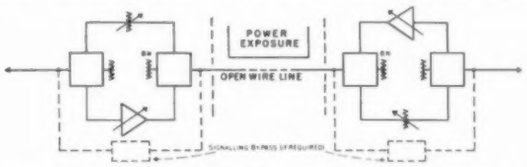
as an amplifier to extend the length of trunk line circuits whose capabilities are exceeded by relatively small amounts. (up to 6 db.) He finds that the small size of the unit imposes no problem in finding adequate rack space for it. He likes the fact that each B-112 terminal equipment incorporates its own, self-contained 115 volt AC power supply, the rear strapping options which also permit operation on various DC voltage combinations. Says these features reduce his inventory problem. He comments particularly on the fact that the same terminal will also operate directly on 48 volts DC.

Mr. "Y" uses it . . . . . .

sometimes as an amplifier but more often as the means for removing noise from physical circuits, this noise being the unavoidable result of power exposure to certain of his open wire lines. Says it is really remarkable how the B-112 can clean up a noisy circuit. Suggests that sceptics take in the Lynch exhibit at the convention and hear this actually demonstrated.

Mr. "Z" doesn't quite understand . . .

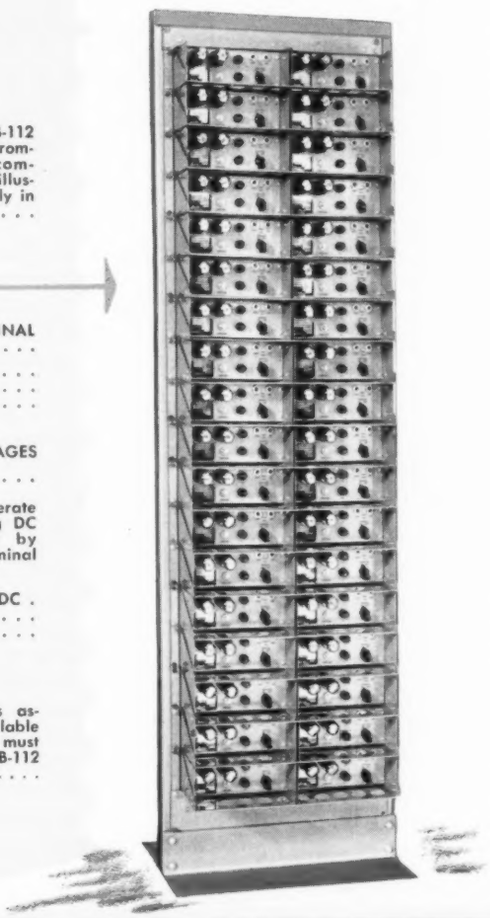
what the B-112 is or how it operates. Lynch engineers explain, "B-112 consists of two, coil-type hybrids with an adjustable amplifier in one branch, a variable loss pad in the other. The block diagram shows this clearly, also points up the fact that two B-112's are required, one at each end of the circuit.



The amplifier may be adjusted for any circuit length extension up to the gain limitations imposed by the internal hybrid balance, normally up to 6 db. Still greater gains are possible by the use of external precision balances. The same unit can also be utilized effectively for the reduction of externally-induced line noise on any physical circuit where the full, usable amplifier gain is not required. Improvement can be really significant too, 18 db being possible. Bear in mind that the degree of noise improvement decreases from this maximum value in proportion to the amount of circuit loss to be compensated."

Mr."Z" now sees where this unit may be the answer to some of his problems, inquires as to price. He smiles broadly when told, places his order . . . .

with . . . .



An assembly of B-112 terminals for a prominent telephone company. The 36 units illustrated mount readily in a 6' relay rack . . . . .

INDIVIDUAL TERMINAL DIMENSIONS . . . . . .

Height, 3½ inches . . .
Width, 8½ inches . . .
Depth, 14 inches . . . .

OPERATING VOLTAGES

115 volts, AC . . . . . .
(built-in supply)
All units also operate from the following DC voltages merely by changing rear terminal strappings:

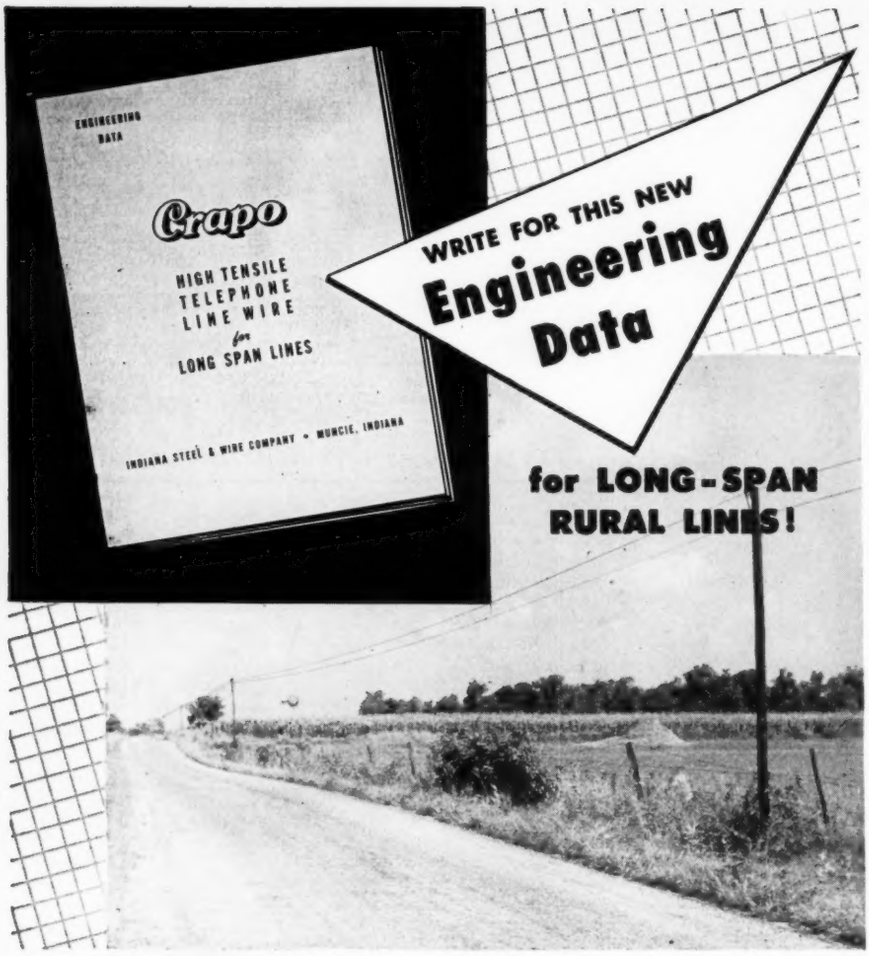
130V DC and 24 V DC .
130 volts DC only . . .
48 volts DC only . . . .

Signalling by-pass assemblies are available where signalling must pass through the B-112 repeater . . . . . .

LYNCH CARRIER SYSTEMS INC.
SAN FRANCISCO, CALIF.

Export Department: PHILIPS EXPORT COMPANY, Division of North American Philips Company, Inc.
100 East 42nd Street, New York 17, N. Y., U. S. A. Cables: PHILYORK

Distributed by Graybar Electric Company


ENGINEERING DATA
Crapo
HIGH TENSILE TELEPHONE LINE WIRE for LONG SPAN LINES
INDIANA STEEL & WIRE COMPANY • MUNCIE, INDIANA
WRITE FOR THIS NEW
Engineering Data
for LONG-SPAN RURAL LINES!

SPECIFY *Crapo* HIGH-TENSILE

TELEPHONE LINE WIRE FOR LOWER OVERALL COST

Crapo HTL-85 — INDIANA STEEL & WIRE CO. MUNCIE, INDIANA U.S.A.

For Medium Long Spans

Crapo HTL-135 — INDIANA STEEL & WIRE CO. MUNCIE, INDIANA U.S.A.

For Longer Spans

Crapo HTL-190 — INDIANA STEEL & WIRE CO. MUNCIE, INDIANA U.S.A.

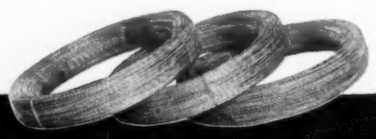
For Extra Long Spans

● FEWER pole structures are required where *Crapo* High-Tensile Line Wire is used in building rural telephone lines. This means substantial savings in time, labor and material. There are fewer holes to dig and poles to set, less material to be handled, installed and connected — all of which contribute to lower overall construction costs.

Crapo High-Tensile Line Wire also makes for lower maintenance costs. Its superior tensile strength offers increased resistance to ice and wind loads . . . provides a greater margin of safety. Heavy galvanized coatings assure dependable, lasting protection.

For maximum savings in the construction and maintenance of rural telephone lines, specify the *Crapo* Telephone Wire which best fits your requirements.

LATEST ENGINEERING DATA, including Stringing Sags and Tensions, Staking Tables and Guying Tables for Heavy, Medium and Light Loading Districts, are now available. Write today for your copy of Data Book No. N-53.



INDIANA STEEL AND WIRE CO., MUNCIE, IND.

Michigan Association Issues Booklet on Industry in State

"The Independent Telephone Industry Across Michigan" is the title of an illustrated brochure telling about the 134 Independent operating companies in the state. It was published and distributed recently by the Michigan Independent Telephone Association.

Described in the booklet are: the extent of service by Michigan Independent companies — both numerically and geographically; the expansion of Independent service in Michigan — today more than double the number of telephones served in 1939; the manner in which rising postwar expenses have consistently required increasing revenues; and why rates must differ between companies.

Special emphasis is placed in the booklet on the reason why telephone companies must be kept financially sound. The reader is assured that adequate rates contribute to good service, and that cooperation between operating companies also pays dividends.

Future developments in the industry are covered briefly. Also included is a list of the Michigan Independent companies.

Distribution is planned to financial institutions, insurance companies, chambers of commerce and other civic organizations.

V V

International Electrotechnical Group Confers on Symbols

Delegations from 11 countries reached preliminary agreements on letter symbols used in connection with electricity, including telecommunications, at a meeting held on Sept. 2 and 3. The delegates were members of Technical Committee 25 of the International Electrotechnical Commission. The committee met during the 50th anniversary celebration of the International Electrotechnical Commission at Philadelphia (Sept. 1-16).

Preliminary agreements were reached on letter symbols in the new fields of electronics and telecommunications as well as on detailed problems concerned with notation for vectors and phasors, and for instantaneous, root-mean-square and peak values.

Earlier editions of the international electrical symbols, published in 1911 and again in 1920, have brought about world-wide use of such symbols as for instance, "I" for current (originally this referred to "intensity of current") and "R" for resistance.

Countries represented at the September meeting of Technical Committee 25 were Belgium, France, Germany, Israel, Italy, Netherlands, Sweden, Switzer-

land, United Kingdom, Yugoslavia, and the United States.

M. K. Landolt, assistant manager, Oerlikon Engineering Co., Zurich, Switzerland, was chairman of the meeting. H. P. Westman, editor, "Electrical Communications," International Telephone & Telegraph Corp., New York, was secretary.

V V

Pressure Treated Wood Would Save $200 Million Loss in U.S.

Failure to use pressure treated wood in construction of all kinds costs the American people about 200 million dollars a year. Pressure preserving treatment, which prevents wood decay, could prevent most of this staggering loss.

U. S. Forest Service figures show that one-fifth of the annual cut of lumber is needed to replace that which has been destroyed by decay. Pressure treatment with preservatives can virtually halt losses caused by decay, yet such treatment costs comparatively little.

Restoration work at Monticello, Jefferson's historic home, has included considerable pressure treated wood to make it fire retardant and resistant to attacks by fungi and termites.

The coveted fire barrier label of the Underwriters' Laboratories, Inc., is worn by wood doors given special fire retardant treatment under pressure.

Pressure treating of wood, to make it resist decay and insects began in England in 1838. Today there are more than 25,000 persons employed by the pressure treating industry in the United States.

The service bureau of the American Wood Preservers' Association, a nonprofit organization to help solve wood treating problems, has been in existence since 1921. Its headquarters are at 111 W. Washington St., Chicago, Ill.

Foresters' figures show that pressure preserved wood used in the past 50 years has conserved 50 million acres of American forests. Pressure treated wood, which should be used wherever wood is subject to termite attack or decay, gives lasting service under the most exacting conditions.

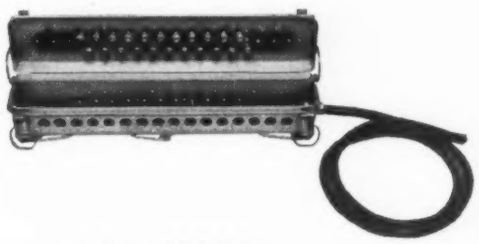
The greatest enemy of wood is decay; this always is caused by fungi. Fortunately, pressure preserving of wood will make it fungus proof.

The second greatest enemy of wood is the insect. Insect damage (like decay) can be prevented if wood is treated with a proven preservative under pressure before use.

United States pressure preserving plants produce approximately 25 million treated wooden fence posts annually.

American railroads figure they save

Stranterm



a new

STRAND MOUNTED CABLE TERMINAL

by Cook

STOCKED BY BUCKEYE

All terminals are supplied with 3½ foot, 24 gauge cable stubs, which are soldered to heavy Everdur studs imbedded in a special unsaturated Polyester thermal setting plastic with fibre-glass filler, which provides indestructible, moisture-proof, gas tight potting of the terminal core.

Additional flexibility is provided in that the 11 and 16 pair cable stub and core are interchangeable in the standard terminal housing. Left and right hand cable entrance to the terminal box is also possible. These alternate arrangements are accomplished by the removal and reinserting of one screw.

Drop wires are dressed and supported by means of three heavy stainless steel wire rings.

The quick opening cover lock and gasketed weatherproof cover design, coupled with the embossed Minigap snap-in sockets, spring bronze ground strip, and the neoprene self adhering drop wire entrance seal, evidence the result of Cook Research and Development as applied to telephone apparatus.

Stranterm also features an ingenious bell shaped cable nozzle which eliminates cable breakage due to excessive right angle bends.

We suggest that you order a sample Stranterm today and investigate the economies and improvements now made possible in your outside plant construction.

●

*The Stranterm is the only Strand Mounted Terminal which permits the installer to apply protection to the pairs requiring dischargers, or to install the same terminal unprotected as determined by the outside plant engineers.

●

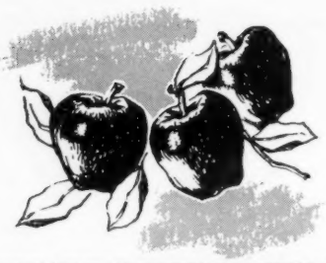
THE STRANTERM IS AVAILABLE IN 11, 16 AND 26 PAIR

FOR FURTHER INFORMATION, WRITE FOR CIRCULAR

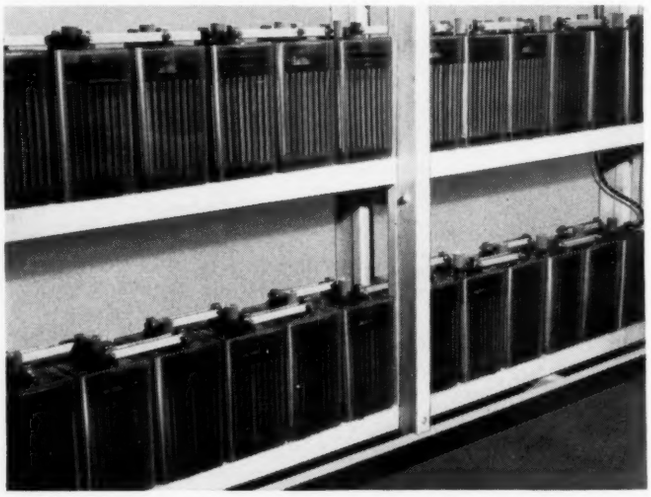
BUCKEYE TELEPHONE & SUPPLY CO.

1250 KINNEAR RD. **COLUMBUS 21, OHIO**

At Oregon-Washington Telephone Co.



The Oregon-Washington Telephone Co. is proud of their newest installation of C&D Batteries at the Hood River, Oregon plant. The 24 PlastiCal cells, Type PCE-540, have a 540 A. H. capacity.



It's C&D Batteries for EXTRA life

For many years to come, the C&D PlastiCal batteries at Hood River, Oregon, will provide continuous, dependable service. Here, in the heart of the world's most famous apple country, the Oregon-Washington Telephone Co. has found that C&D has the answer to telephone battery needs.

When you order your next telephone battery, specify C&D. For with C&D, you get:

1. **One-piece, permanently-sealed plastic case. Entire unit is shock-resistant and lighter and more compact than glass or rubber.**
2. **Elimination of sudden leaks due to internal stresses.**
3. **Easier maintenance, because patented Post Seal eliminates acid creepage.**
4. **Lower shipping costs. Light plastic case reduces total in-place cost.**

You can order C&D Batteries from your equipment supplier.

C&D

Write for Bulletins!

For details and specifications on C&D telephone batteries, write for Bulletins T-527, T-528.

BATTERIES, INC.

of Conshohocken, Pa.

Manufacturers of Industrial Batteries since 1906

SALES AND SERVICE OFFICES IN PRINCIPAL CITIES FROM COAST TO COAST

$775,000 per day as a result of using pressure preserved ties. Preserved ties installed in 1954 have an average life of 30 years, compared to only six and one-half for untreated ties.

Use of pressure preserved railroad ties means an annual saving of 300 ties per mile of single track, or approximately 200 million cubic feet of wood per year.

Service life of pressure preserved utility poles is 50 years. Annual cost, therefore, is a fraction of what the cost would be if untreated poles were used.

Pressure preserved wood piles under masonry building foundations are considered by engineers to be permanent items in the construction.

Pole frame construction, employing pressure preserved poles, can cut farm building construction costs almost in half. Data may be obtained from the American Wood Preservers' Association.

Pressure preserved timber blocks are used in great quantities for industrial flooring. They provide a permanent floor, with resilience and yet with phenomenal resistance under both foot and vehicular wear.

Wood boring insects, mainly termites, do 45 million dollars annual damage to untreated wood products. Pressure preserving of wood, using creosote, salts or other approved compounds, will make wood termite-proof.

The fungi that caused wood decay feed upon the wood. When this food supply is treated by injection of preservatives under pressure, the fungi can not grow.

American railroads are the greatest users of pressure preserved wood. They find it much cheaper to use wood which resists decay and insects than to use untreated wood.

Pressure treatment of wood performs a triple service. It increases life of the wood three or more times, it makes sapwood longer-lived than the most durable heartwood, and it permits use for construction of naturally non-durable woods.

Primary American trees from which structural lumber is obtained are Southern yellow pine and Douglas fir. They have equivalent stress ratings and make up the bulk of the timber which is pressure preserved in the United States.

Mere coating of preservatives on wood, through dipping or painting, is not sufficient, since the slightest crack or cut may permit entrance of some destructive organism. To get the preservative deeply into the wood the pressure process must be used, the American Wood Preservers Association states.

Pressure preserving of wood means forcing a toxic substance deeply and uniformly into the wood under pressure, thereby protecting it against attack by either fungus, termites or marine borers.

Pressure creosoted piles and timbers have been used extensively for marine structures in the North Atlantic area for more than 50 years.

Creosoted pilings are preferred for marine piers, wharves, docks and similar structures because of their long life, superior strength, lightness and resilience under impact imposed by moving vessels.

Fire retardant wood is chemically impregnated (under pressure) to make it incapable of supporting combustion. It also is more difficult to ignite at ordinary temperatures.

V V

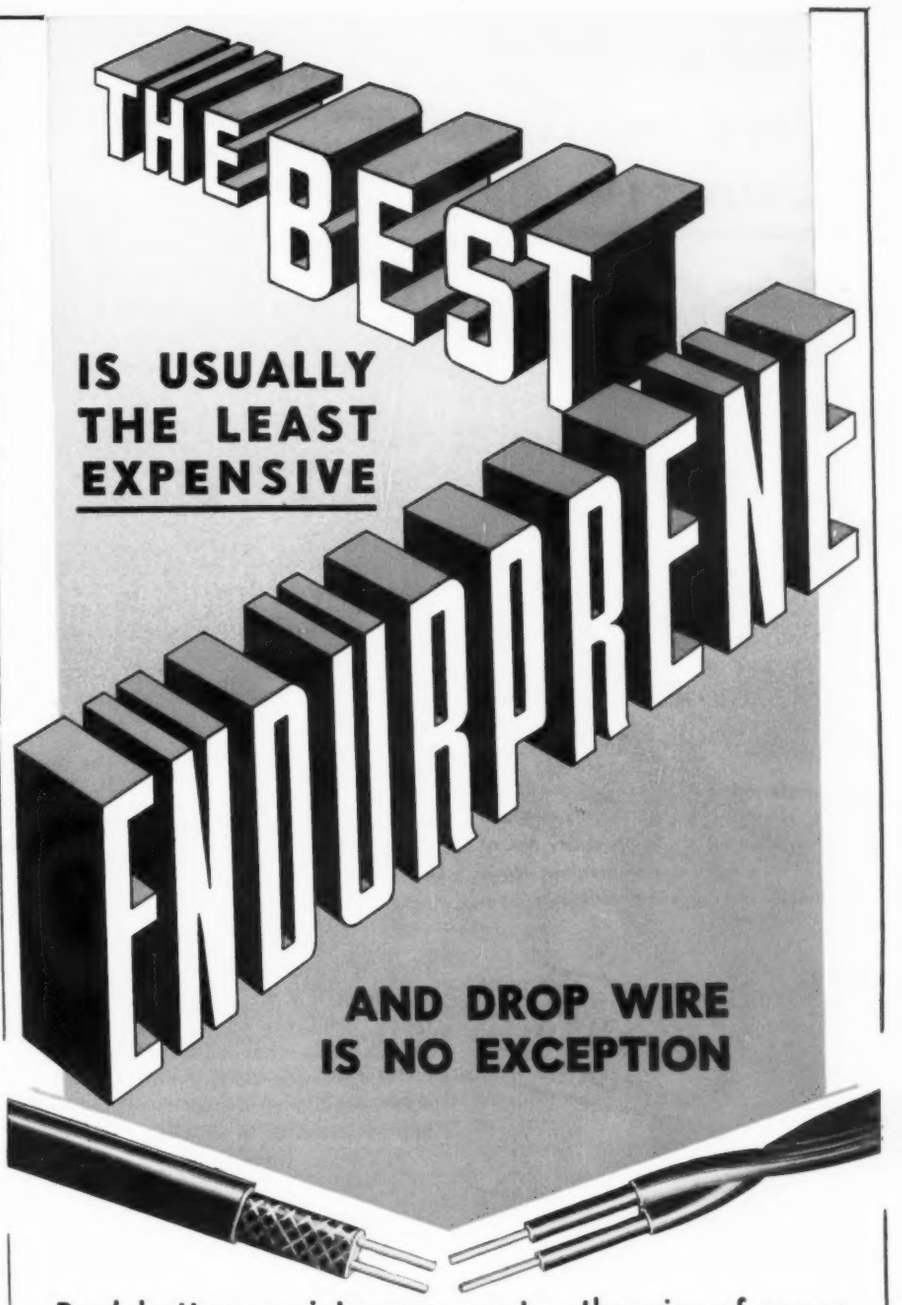
BOOK REVIEW

"ALTERNATING CURRENT MACHINES," by Puchstein, Lloyd, and Conrad; third edition. 721 pages. Price, $8.50.

Describing construction, principles of operation, methods used for making and working up tests, and simple methods for predicting behavior, regulation and performance of ac machines, this well-known text now introduces significant new changes while retaining most of its original form. The authors have modified the approaches to the theories of some of the machines, and provide more detailed developments of equivalent circuits, vector diagrams, methods of calculating the cross-axis voltages of synchronous machines, and the equations describing the oscillations of synchronous motors. Both the double-revolving field theory and the cross-field theory have been retained for the single-phase induction motors, and additional material has been added in the latter to clarify the polarities of the transformer and speed voltages.

New material is also provided on adjustable-speed drives, rectifiers, and self-synchronous machines. Methods of determining the constants of synchronous machines have been added, and the authors explain the nature of short-circuit currents in alternators on the basis of the constant flux-linkage concept.

A. F. Puchstein, a consulting electrical and mechanical engineer with the Jeffrey Mfg. Co. in Columbus, O., was formerly associate professor of electrical engineering at the Ohio State University. T. C. Lloyd is chief engineer at Robbins & Myers, Inc., in Springfield, O., and was formerly associate professor of electrical engineering at Antioch College. A. G.



Rock-bottom maintenance costs—the aim of every on-the-ball plant executive—come when you buy the drop wire that stays up, year after year, storm after storm.

NEOPRENE!

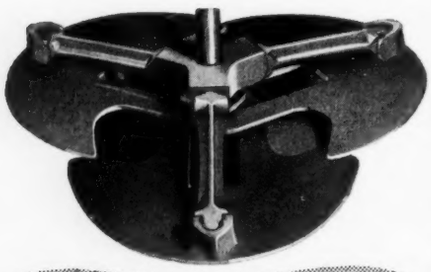
Ask your own Kellogg man for the whole story. He will be glad to furnish you an interesting box of samples.

DISTRIBUTED BY:

KELLOGG SWITCHBOARD & SUPPLY CO.
CHICAGO, ILLINOIS

GENERAL INSULATED WIRE WORKS, INC.
PROVIDENCE 5, RHODE ISLAND

EXTRA HOLDING POWER
QUICK INSTALLATION
TOUGH FOR LONG LIFE

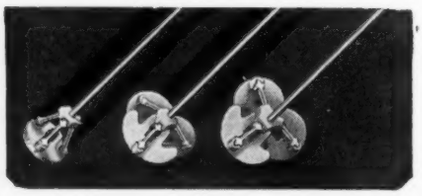


EVERSTICK ANCHORS

The preferred anchor of engineers and crews alike for permanent construction and maintenance work. Complete line of sizes to meet every guying problem. Made of tough, rust resistant malleable iron.

Special nut housing locks anchor firmly on rod and prevents rod from slipping through anchor.

QUICK INSTALLATION



Everstick plates are so designed to expand easily and quickly into undisturbed earth. The wide coverage of expanded anchor assures great holding power in any kind of soil. Write for bulletin.

EVERSTICK ANCHOR CO.
FAIRFIELD, IOWA

Conrad is professor of electrical engineering and chairman of the department at Yale University, as well as a fellow of Timothy Dwight College.

This book may be purchased through TELEPHONY.

V V

AIEE Meeting Includes Papers Of Interest to Telephone Field

The American Institute of Electrical Engineers (AIEE) will hold its fall meeting in October at the Hotel Morrison, Chicago. On the morning of Oct. 14, two papers will be presented which will be of interest to the telephone industry. The two are:

"A Transatlantic Telephone Cable" by Mervin J. Kelly, president, Bell Telephone Laboratories; Sir Gordon Radley, engineer-in-chief, Post Office Engineering Department, London, England; G. W. Gilman, director of systems engineering, Bell Telephone Laboratories, and R. J. Halsey, assistant engineer-in-chief, Post Office Engineering Department, London.

"Rural Automatization in the Swedish Telephone System" by B. Bjurel, director, telephone exchange development department, Swedish Board of Telecommunications, Stockholm, Sweden.

Dr. Kelly will present the transatlantic cable paper. It traces the history of communications across the North Atlantic. It also discusses the many problems of design, laying and maintenance that had to be solved to assure reliable service on a cable system with submerged repeaters at depths ranging to 2 miles.

The rural automatization paper deals with the considerations leading to the choice of switching systems, trunking plans and transmission, as well as descriptions of the types of plant employed in rural Sweden.

"Why Marge, I've been trying to get you for the past 15 minutes!"

New!

Developed by independent telephone engineers specially for small and medium companies . . .

hook-switch HOWLER

Solves improper subscriber-disconnects from Central Office. Will quickly (often within a month) pay for itself. The line is automatically clear when subscriber hangs up. Uses standard telephone DC voltages. Simple to use. Portable. 10 year life.

Order one now—end your troubles.

TELE-SYSTEMS, INC.
6442 Santa Monica Blvd.
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DEVELOPMENT & FIELD SYSTEMS ENGINEERS

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With a progressive, expanding, well established corporation. Interviews will be arranged for qualified applicants. Send complete biographical resumé, experience and education to

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MARYLAND ELECTRONIC MFG. CORP.
5009 CALVERT ROAD
COLLEGE PARK 6, MARYLAND

TELEPHONE CARRIER

Continued from page 44

tion before the circuit gets too much loss in it to talk over it satisfactorily. The problem becomes one of balancing low volume against echo for the best overall result. In some cases we have to bail ourselves out by using special devices like echo suppressors which too have distinct limitations.

As a result of many judgment tests, we have a fair idea of how loud echo can be for different amounts of delay and still not be too annoying to the average talker. We also know the distribution among individuals of their tolerance to echo. Combining these data with other data pertinent to the problem we can arrive at a curve which shows the relationship between circuit loss and round-trip delay which will produce satisfactory echo conditions on any desired percentage of connections. For example, the curve on *Chart 2* shows the relationship between round-trip delay (i.e., propagation time out to the far end and back) and the one-way circuit loss for the condition where one in 100 talkers selected at random would be annoyed by echo.

It is not to be construed that one in 100 is any sort of objective — it is simply an illustration. In actual practice, margins are included so that the probability of encountering annoying echo is very much smaller than one in 100.

While this curve is only illustrative, it will serve to show the advantage of high velocity. What it shows is that

Answers to Traffic Questions On Page 34

(1) Yes, at the first opportunity after obtaining it.

(2) Say for example, "You may wish to make a note of the number — (No.)" or "(address, name)'s number is (No.), if you care to make a note of it."

(3) Ask, "Did you get the number?" if this seems appropriate, or repeat it at the first interval of waiting or just before a report.

(4) Say "(called number) (calling place) is calling."

(5) It is generally desirable to permit her to deal directly with the calling party. Therefore, if he speaks up in reply to the operator's question, listen and make necessary ticket entries but do not interrupt.

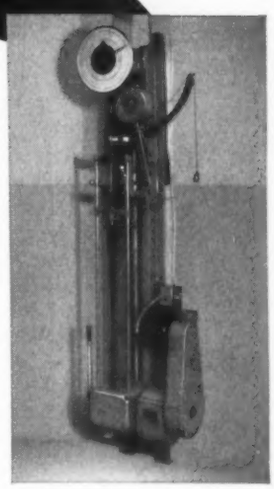
ADHESION TESTS SHOW THE CONDUCTOR BREAKS BEFORE LOWELL INSULATION SLIPS

No. 2 in a series of test results on LOWELL TELEPHONE DROP WIRE. "P Clamp" adhesion test.

The greatest strain on drop wire takes place at the "P Clamp" where the wire is attached to pole or house. The weight of ice and the whipping action of the wind develop extra strain at this point so that the best possible bond is essential, between the insulation and the conductor wire, to insure dependable service and long life.

To develop the strongest possible adhesion, all Lowell wires are brass flashed and special formulas have been evolved for insulation compounds. Lowell jacket compounds also have excellent resistance to abrasion and the ability to withstand the action of the elements under varying atmospheric conditions.

As a constant check, tensile tests are made at the Lowell Laboratories where the conductors are stretched to their breaking point before any slippage of the insulation or jackets takes place. These rigid laboratory tests are your assurance that Lowell Drop Wires will stand up under the most severe conditions and give dependable service without breakdown at this most critical point where the grip of the "P Clamp" must support the entire weight of the span. Year marker threads and manufacturer's identification permit user to keep accurate records of performance and long life in service.



Lowell Drop Wires are continually tested for adhesion of the insulation to the conductor. The conductor must break before the adhesion bond between the insulation and conductor is severed.

Write for Lowell Insulated Wire Catalog

"fine wires only"

LOWELL INSULATED WIRE DIVISION OF The Overlakes Corporation
171 LINCOLN STREET ··· LOWELL, MASSACHUSETTS

for a given desired over-all loss we can have a longer circuit if it has a higher velocity or, conversely, for a given length a high velocity circuit can be operated at a lower loss than a low velocity one. For example, we can operate a 500-mile carrier circuit having a velocity of 100,000 miles per second at the same loss as a loaded cable circuit having a velocity of 20,000 miles per second about 100 miles long.

So much for velocity of propagation.

The other reason I mentioned for superior performance of carrier is that it is electrically four-wire. This four-wire operation is obtained by one of the following methods:

(1) Use of the *same* frequency in each direction of transmission on *two* physically separated paths, as is done with K carrier; or two electrically shielded paths, as is done with coaxial.

(2) Use of *different* electrical frequency regions in each direction of transmission on a *single* path, such as is done with 01 and other open wire carriers.

(3) Use of *both* schemes—different electrical frequencies and two separate paths, such as is done with N1, ON and radio.

ACORN
INSULATED
WIRE
ACORN
Acorn wire has meant quality since 1914. Neoprene jacketed for drop, distributing and bridle wire. Acorn plastic insulation for inside, jumper and cross connecting wire. Specify Acorn.
ACORN INSULATED WIRE CO., INC.
36 FREEMAN STREET, PAWTUCKET, RHODE ISLAND
LEICH SALES CORP., 427 W. Randolph St., Chicago
THE LINDSAY TELEPHONE SUPPLY CO., 7016 Euclid Ave., Cleveland
NORTH ELECTRIC MANUFACTURING COMPANY, 501 South Market Street, Galion, Ohio

Let's examine why four-wire operation is advantageous. In the first place, practically every circuit must have repeaters in it at fairly frequent intervals. In a four-wire circuit, there is no path from one side of the circuit to the other except at the ends. However, in a two-wire circuit, as shown in *Chart 3*, each two-wire repeater in a circuit provides a place where talking currents can leak across from one direction to the other in addition to the leakage path at the end of the circuit. Thus, with two-wire circuits there is more echo and a more complex set-up of echo currents than in a four-wire circuit.

In addition to echo, two-wire operation also increases the problem of cross-talk. I do not believe it is worthwhile to take the time here to examine this problem in detail. However, I will summarize it by saying that, with two-wire operation, the repeaters amplify the cross-talk which exists on the line much more than they do with four-wire operation.

In summary, I can make this statement with particular reference to the Bell System. If it were not for the fact that a very large portion of the circuits are on carrier or will be within the next few years, we would be greatly handicapped in our plans for a nationwide dialing system. Carrier is the most important single transmission factor in giving good nationwide dialing service.

Types of Carrier

While I do not want to discuss the technical characteristics of carrier systems in any detail, I think I should give a brief summary of the types of carrier systems now in common use in the Bell System. Such a summary is given on *Chart 4*.

I should like to make it clear that the types of carrier systems listed in this chart are only those designed by the Bell Telephone Laboratories and manufactured by the Western Electric Co. There are numerous other carrier systems on the market designed and sold by other manufacturers to do similar jobs to the systems listed in the chart. The only reason I do not include them is that I am more familiar with the Western Electric types.

[**EDITOR'S NOTE:** *See accompanying box for carrier systems manufactured by Independent manufacturers on page 45.*]

You will also note that some of the good old types which have been the backbone of the earlier carrier developments are not listed; specifically, I have not included the H, the C or the J systems. Their omission does not imply that they are still not good systems but their rate of production

SHERRON

STANDARDIZATION MAKES POSSIBLE MULTIPLE OUTDOOR BOOTH INSTALLATIONS FOR GREATER EARNINGS

Shown below is a multiple outdoor booth installation in which the booth at the extreme left contains the LITE-OMATIC photo cell, while the middle booth is equipped with the ASTRA-DOME roof.

This combination gives all three booths the full benefits of automatic illumination and night visibility.

Only the standardized construction of Sherron booths makes such a grouping an easily accomplished reality. Booths are joined with separators which have the appearance of a trim, and special sealers protect the booths against the elements.

You can add Sherron booths to multiple set-ups when, where and as you need them.

SEE OUR EXHIBIT, ROOM 560, CONRAD HILTON HOTEL
USITA CONVENTION OCT. 11, 12, 13

FOR AN ENTIRE GROUPING *One* ASTRA-DOME!
One POWER AND COMMUNICATIONS ENTRANCE!
One LITE-OMATIC PHOTO CELL!

SEE COMPLETE SHERRON LINE IN TELEPHONY DIRECTORY AND TELEPHONE ENGINEER & MANAGEMENT DIRECTORY

SEE OUR SPECIFICATIONS SWEET'S

SHERRON METALLIC CORPORATION
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and application is rapidly falling off because of the availability of the newer and cheaper systems. Also, I wanted to have a list which was small enough so that I could readily manage it in discussing the important factors in the selection of types for specific needs.

While you probably know all about the systems on this list, it may be worth while to run over their characteristics briefly.

The Coaxial Systems—L3 and L1. These are systems designed primarily to go on the special type of cable known as coaxial. However, the L1 system is also the one which is used generally to provide telephone circuits over heavy duty relay systems—notably the TD2.

The L3 system is the newer and, as indicated in the table, triples the message circuit capacity of a coaxial cable as compared to L1. It is just now going into service. So far it has not been applied to TD2 systems, but it probably will be used on some sort of radio systems eventually; either TD2 or the TH system now under development.

The most important characteristic of the L1 and L3 systems, from the standpoint of this table, is their heavy-duty nature. They are like a heavy-duty truck—very good in their field—but inefficient for handling small loads.

K Systems. This is the old standby for long-haul cable circuits on moderately heavy to heavy routes. It provides 12 circuits on two pairs; the two pairs being used for oppositely directed transmission and being in different cables. It is the system that saved our necks during World War II when we had a very rapid growth in long-haul business and copper was very scarce.

It was, and is, a very good system, but it has almost lost out to competition; the L1 and L3 systems on the one hand, and the N1 and ON systems on the other have practically put it out of the running for new routes.

N1 and ON Systems. The N1 and ON systems are the newest and most versatile members of the team—at least as far as cable is concerned—for anything from around 20 or 25 miles up to, perhaps, 500 miles and have this field practically to themselves except for the heavy-duty L1 and L3 systems.

The N1 system is the older of the two, but it is only three years or so of age. It provides 12 circuits on two pairs in the same cable. The two directions of transmission are separated both by being in different frequency regions and by being on different pairs. Cross-talk is controlled by interchanging (frogging) the frequency regions at each repeater and by the use of compandors* which are built in at the terminals. It is miniaturized, has advanced components and design, and has built-in dial signaling, along with other features which have been adequately described elsewhere.

The first commercial installation of the ON system is just now getting under way. The "N" part of the name comes from the fact that, between the ends, it is an N1 system; the repeaters, power supply, cable pairs, etc., are identical with N1. The "O" part comes from the fact that the terminals are the same as for the O1 system (discussed below) except for a different frequency allocation and the added gear necessary to use this frequency allocation.

The ON system gives 20 channels on two pairs in one cable. The reason we can get 20 channels through the N1 repeaters is that the ON is single sideband whereas the N1 is double sideband.

O1 Systems. There are really four separate systems making up the galaxy known as O1. Each system will provide four channels and any or all four of them can be put on a single open-wire pair. They are as follows:

System	*Frequency Range***
OA*	2 to 36 kc
OB	40 to 76 kc
OC	80 to 116 kc
OD	120 to 156 kc

*In some cases, the voice frequency circuit on the pair is retained and the OA is cut back to three channels.

**Each direction of transmission of each system occupies about half the allotted range shown.

With these systems we can get 16 carrier telephone circuits on an open-wire pair and, if we want, three or four carrier telegraph channels below the bottom frequency of the OA system.

A feature of the O1 and ON combination is that conversion between them is relatively simple. Thus, we can go as far as we want to in cable with 20 channel ON on two pairs and, with relatively simple gear, break out into open wire, dividing the 20 channels among OA, OB, OC and OD systems on one pair and one of these on another pair in combination with other systems on that pair, or in any other way we please.

(To be continued)

*Compandors are voice actuated devices which put a high loss at the receiving end of the circuit when no speech is present and thereby greatly attenuate cross-talk under these conditions. When speech arrives, this loss is reduced. At the same time the speech causes changes at the sending end so that the over-all loss from talker to listener stays the same. In the presence of speech the cross-talk is swamped out by the wanted speech sound.

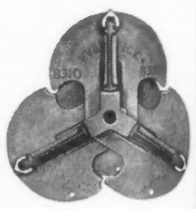
Construction m
and S
WITH THE DOUBLE GUA
STROMBERG-CARLSON AND
LEADING MA

everstick anchors
. . . are designed to meet the most rigid anchoring and guying specifications.

The patented EVERSTICK Nut Housing locks anchor firmly on rod, making installation simple under all conditions and permitting easy recovery of the rod. Note well-designed, heavily constructed sections of metal in base plate.

EVERSTICK Expanding Plates are *ribbed* to double their original strength; their cutting edge and wedge shape arm socket reduces earth resistance to a minimum and assures easy expansion.

Three-Way EVERSTICK with expanding plates—contacts solid earth at every point around base plate, giving full benefit of earth's holding power.



Spreader Arms extra heavy ribbed with ball and socket joint at top and clinched socket on expanding plates allow heavy bearings to move freely with minimum friction, insuring easy expansion which eliminates buckling or breaking of arms.

EVERSTICK Anchor
. . . the anchor of merit

...materials
...Supplies
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...AND AMERICA'S
...MANUFACTURERS

Cook PLX

plastic loop unprotected cable terminal

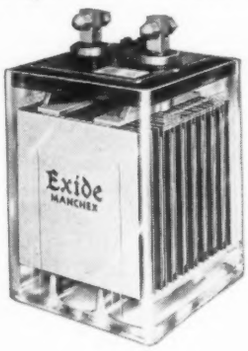
Simple to install—requires no stubbing, no splicing, no potting. Simplicity gives you economical freedom from maintenance. Heavy galvanized steel frame and deep drawn chamber, welded zinc cover, and the famous XB Bakelite face plate with heavy Everdur studs comprise the major features of this new Plastic Loop Unprotected Pole Cable Terminal.

When ordering, specify cable size so that correct size grommet is installed.

Manufactured by Cook Electric Company

Exide-Manchex

telephone batteries



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For Central Office and Private Branch Exchange Equipment

This is proven daily in exchanges of every size . . . for over 60 years Exide Batteries have been serving the Telephone Industry . . . the Manchester positive plate with its exclusive button type construction provides exceptionally long life . . . latest developments on molded glass jars permit compact space saving installation . . . heavy terminal posts with copper inserts provide extra conductivity for sustained voltage at high discharge rates . . . microporous rubber along with slotted plastic separators, are impervious to chemical and electrical reactions . . . plastic spacers assure plate alignment . . . for assured dependability, long life and low-cost maintenance use Exide Manchex.

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is pre-tested to operating company requirements

Before a single inch of Kennecott cable leaves the mill, it is tested for Dielectric Strength, Insulation Resistance, Conductor Resistance, Capacitance and Fixed Dimensions. Such care in manufacture is your warranty of efficient, trouble-free performance in the field. Specify "Kennecott"—distributed by Stromberg-Carlson.

Distributed by STROMBERG-CARLSON

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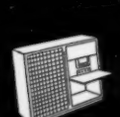
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May We Have the Pleasure?

Convention days are the time for meeting old friends and new friends . . . for conversations covering the grounds of our common interests . . . for getting answers to questions about telephone directory printing and picking up ideas that may pay out big on time spent in convention.

Hope to see you early. Please drop around, or give us a ring!

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- Aerial Tents
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- Lashing Wire Clamps and Grips
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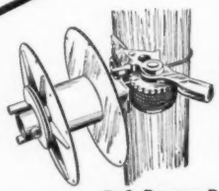
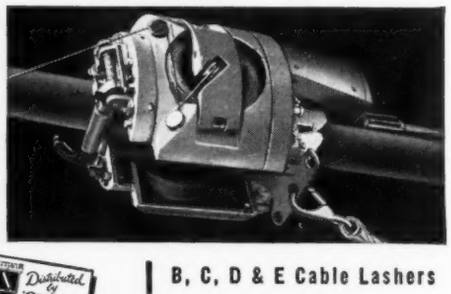
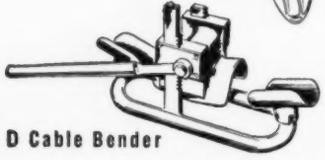


R S Power Reel

C R Power Reel





D Cable Bender

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B, C, D & E Cable Lashers

Special Purpose Tools To Specifications

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Over 250 various items of Line Construction Tools, Maintenance & Pressure-Testing Equipment in stock for immediate Shipment

SPECIALIZED COMMUNICATIONS EQUIPMENT SINCE 1918

GMPCO

VOICE CHEERFULNESS

Continued from page 50

morning. His office hours are from two o'clock until five. May I ask him to call you when he comes in?"

Have student use such phrases as are adaptable to her work. Make suggestions for new phrases if those she uses seem stereotyped or not fitted to the situation being demonstrated. Watch closely — articulation, diction, affected voice.

Vowel Sounds

Vowel sounds are vocal tones which are given the proper form or character by the position in which the various parts of the mouth are placed. The slightest variation of the placement of the tongue, lips or jaw will change the character of the tone.

Vowel	*Sounded*	*Correct Position of Mouth*
A	ah	Well open.
A	ay	Half open.
A	aw	Well open, lips slightly rounded.
A	at	Three quarters open.
E	ee	Almost closed.
E	eh	Half open.
O	oh	Open, lips rounded.
ou	south	Open, then closing.
oi	oil	Closing, then open.
I	it	Quarter open.
I	eye	Open, then closing.
U	uh	Half open.
U	oo	Almost closed, lips slightly rounded.

Consonant Sounds

Breath Consonants	*Voice Consonants*	*Nasal Consonants*
P	B	M
F	V	N
T	D	
K	L	
S	R	
SH	G	
CH	Z	
TH (Three)	J	
X	TH (Then)	
H	Y	
	W	
	WH	

Contractions are permissible when sanctioned by good usage — Haven't, Isn't, Don't, Doesn't, Can't, Didn't.

Watch for slurring in student's diction—(1) "Didja" for "did you"; (2) "willya" for "will you."

Watch for slang. It has no place in telephone conversation. It is too easily misunderstood. Besides, it may cause an unfavorable reaction from customers.

Have students try sentences with faults and then repeat them without the faults. Let student note difference; if she doesn't, point them out to her.

Remember, you are not teaching "good English." But it might help the student to point out poor diction faults as she practices on a tape recorder.

Practice Sentences

While these practice sentences are for use on tape recording, if no recorder is available, they can be used for practice without as well.

For distinct enunciation, every word, every syllable, every sound must be given its proper form and value.

Try to visualize the person on the other end of the line. Pretend you are speaking to him face to face.

Your voice is the most distinct expression of your inner self. Be careful, through it, to do yourself justice.

Naturalness in actions and expressions is dictated by the heart rather than the mind. You can be natural only when you are sincere in your desire to give good telephone service.

Cheerfulness is contagious. Your manner and actions can spread cheer which will go through your transmitter to the customer.

Follow a person's manner of pronouncing numbers and words, but be careful—do not mimic personal, racial or sectional mannerisms.

Adopt phrases that suit your voice. Some phrases sparkle when spoken by one but "fall flat" when used by another.

Have student read sentences with lips stiff, jaw rigid, mouth nearly closed. Then have her say the same sentences with lips and jaws flexible and mouth open for best delivery.

Have student hold "mike" too far from lips and read sentences. Then at the proper distance for good transmission and read again. This should demonstrate the need for transmitter being right distance from lips.

Have student talk loudly and then quietly, demonstrating the modulated voice clearness and the slurring effect of too loud speaking.

Have the student read the sentences quickly, then slowly and distinctly, demonstrating the need for keeping at the slow pace, if the calling party is to understand what is being said without too much effort.

V V

Recorded Stock Market News Provided by Telephone

Stock market information is now available just like the weather and time of day, by telephone, through a new service inaugurated in Philadelphia the week of Sept. 13, by H. A. Riecke & Co., Inc., members of the Philadelphia-Baltimore Stock Exchange.

By merely dialing the required number, investors hear an up-to-the-minute recorded summary of the latest stock market news.

V V

Necessity is the only successful adviser.—CHARLES READE.

TROUBLE CLEARING

Continued from page 58

terval, such as a week, is known this can be divided by 168 (the number of hours in a week) and the rectifier set at that figure. The final adjustment is made by checking the specific gravity at the same time each week. If the specific gravity goes down, the output of the rectifier should be increased. The "trickle charge" is often used today but it must be remembered that it is *not* a float. The battery charges on light load, or no load, and discharges when the load is above average.

Before the full float method was developed some attempt was made to level the voltage by the use of counter cells and end cells.

The counter cell looks somewhat like a storage cell but requires almost no maintenance. When current is passed through it, it develops a voltage which always opposes the current. One or more counter cells may be cut into the discharge circuit (but not the charge circuit) to reduce the voltage at the bus bars when the battery is being charged.

End cells, or emergency cells, are storage cells of the same type and size

SOMETHING NEW

has been added!

1904 - 1954

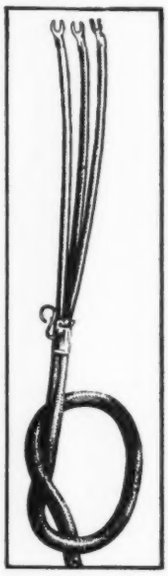
At the close of our 50th year and the beginning of a new and exciting half century, we wish to thank our many friends of the U. S. Independent Telephone Association for their loyal support.

Stop in and see us in Room 610-A and see the newest addition to the CHURCHILL line of telephone booths.

CHURCHILL CABINET COMPANY

2119 Churchill Street Chicago, Ill.

LET CORD CLAIMS CONFUSE YOU



After all, there is only one way to sensibly evaluate telephone cord performance and that is to put them to the final test —*actual service!* So we invite you to "service-test" COMMERCIAL CORDS on your own installations and judge for yourself. We'll gladly furnish cords for such tests if you'll tell us about your requirements.

COMMERCIAL MAKES CORDS BETTER-TO LAST LONGER!

Write, Wire or Phone

COMMERCIAL CORD & SUPPLY CO., INC.

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CORDS FOR ALL MAKES AND TYPES OF TELEPHONE INSTRUMENTS

as the main battery. One or more are cut into the discharge circuit to boost the voltage in case of a heavy load while the battery is discharging. The end cells must be charged separately, usually by means of a small rectifier.

For a long time there was a controversy between those who believed that a battery did better if it was "worked," i. e., repeatedly charged and discharged, and those who believed that a battery should be worked as little as possible as in the present full float method. As in most controversies there is some truth on both sides. A battery which is discharged almost to the limit and then recharged, and with this cycle repeated at frequent intervals, is indeed more active and better able to take care of an emergency heavy load, but this is at the expense of a greatly shortened battery life.

Under the routine which we have just described the positive plates had to be replaced at least every five years and often at the end of three, or even two, years. The general rule was to replace the negative plates at every second replacement of the positive plates. The wooden separators were replaced each time a set of plates was changed. Fortunately the lead lined wooden tanks lasted indefinitely if they were kept dry and well painted.

On the other hand the life of a battery on full float which has been correctly maintained *and which has had no accidents* is very long. The full float method has not been in use long enough to determine just how long a battery should give good service but it exceeds the claims made by the manufacturers. However, the battery may not have the emergency capacity of a battery that has been "worked."

The automatic full float method of battery maintenance changed the picture completely and gave us some entirely new ideas about battery maintenance. We believe that the credit for this improvement should go to the Independent operating companies and the Independent manufacturers. However, we will save this subject for another article.

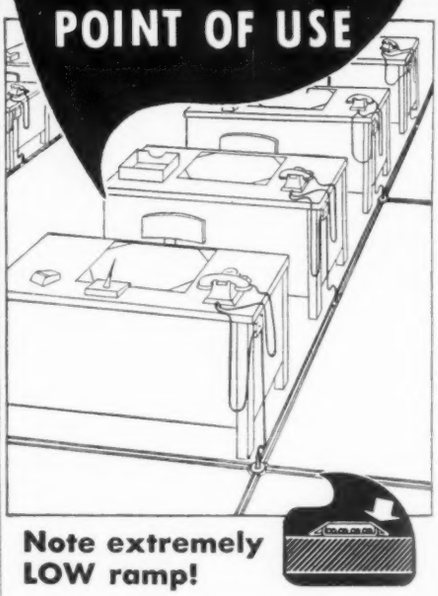
V V

"Our country is built on the pillars of faith and courage. By overcoming starvation and the perils of the wilderness, our forefathers developed the capacity that enabled them to deal with stern reality, and through their energy, daring, and vision they laid the foundation for the American system which rests primarily upon personal initiative and individual freedom."—*Excerpt from New England Letter, published by The First National Bank of Boston.*

PANCAKE

OVERFLOOR RACEWAYS

Here's the *easiest* way to get TELEPHONE OUTLETS right to the POINT OF USE



Note extremely LOW ramp!

There's no question about it . . . PANCAKE is the simplest, safest way to get telephone outlets right to the point of use!

PANCAKE carries telephone wiring overfloor to ANY point where telephones are needed. It is easily installed without channeling into walls or floors — just as easy to move and extend. PANCAKE is extra sturdy, too — BOTH base and cover are heavy gauge galvanized steel. Two interconnecting sizes answer every requirement.

Write today for the PANCAKE booklet giving specifications and full information!

WIREMOLD

Makers of

PLUGMOLD – multi-outlet systems

WIREMOLD – electrical raceways

PANCAKE – overfloor raceways

THE WIREMOLD CO.

Hartford 10, Connecticut

news on new PRODUCTS

TELEPHONE TACKER—The Markwell Mfg. Co., Inc., states its "L3" telephone tacker is a much-used tool in a telephone installer's service truck —both for stapling telephone wire and drop wire (with Markwell 5/16-inch, 7/16-inch and 9/16-inch leg staples) and for fastening aluminum and light-gauge metal numerals in telephone poles.

In the fastening applications, only one hand is required to operate the tacker, thus leaving the other free to hold the material. The company says that even with gloves on, the tacker may be used to drive ¼-inch or 5/16-inch leg staples through telephone pole metal numerals.

In addition to tacking telephone wire, the "L3" tool is useful in and around telephone buildings and plants wherever a brad, thumb tack or string might otherwise be used. Request NP 309.

• • •

WRITE ON ANY SURFACE — The Markwell company also has recently introduced Markwell dry pens in a "Four Kolor-Pak."

The Four Kolor-Pak consists of four improved Markwell dry pens fully equipped with a safety clip permitting the operator to carry the container around in his pocket, if he desires; plus four ½-ounce bottles of red, blue, green and black ink and four different tips for each pen in round, chisel, T-shaped and thin points to take care of nearly every type of marking.

The special aniline die ink that is used for these pens will write on nearly any type of surface—glass, wood, cartons, metal, etc.

The plastic box that the pens come in would also be useful for carrying small bolts, nuts or screws, the company states. Request NP 310.

• • •

NITELIGHTER—A new light control device for telephone booths works automatically when darkness comes. Called the "Nitelighter," it is produced by The Fisher-Pierce Co., Inc., a leading manufacturer of photoelectric controls for municipal and industrial lighting systems. The Nitelighter turns on lights in booths the moment darkness comes — thus customers never have to approach dark booths.

TELEPHONY PUBLISHING CORP.
608 S. Dearborn St.
Chicago 5, Ill.

Please have the manufacturer send me without obligation the literature indicated by the following numbers:

NP309_____;	NP310_____;
NP311_____;	NP312_____;
NP313_____;	NP314_____;
NP315_____;	NP316_____;
NP317_____;	NP318_____;
NP319_____;	NP320_____;
NP321_____;	NP322_____;
NP323_____;	NP324_____.

Name.....

Title.....

Company.....

Street.....

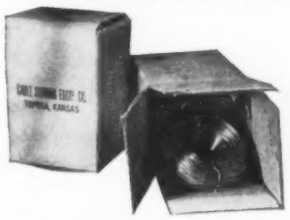
Town and State.....

9/25/54

Here's the Neale Model K Pull Type Spinner—engineered for versatility. It's doing a great job on electric power lines . . . and telephone lines, too! Model K has a maximum capacity of three 2″ O.D. cables, and will spin single cable as small as ⅝″ O.D. This spinner may be used with either one or two coils of spinning wire, so you may have either a 13″ spiral or wire 6½″ apart. Model K is furnished with two LC5 Lashing Wire Clamps, tow rope, cable placing dolly, and chest.

Contact your jobber

Use Neale Wire For Best Results



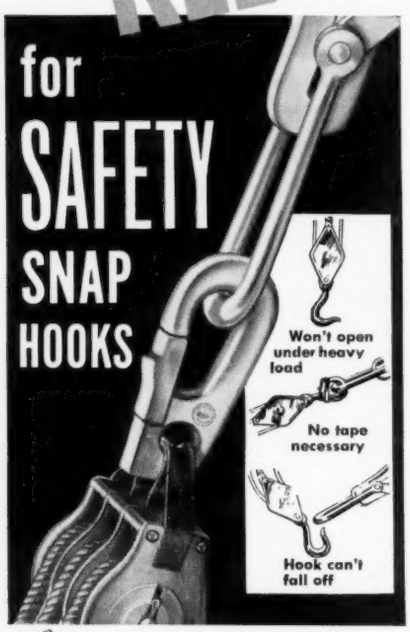
Available in 7 different types. There's just the wire for your particular requirements.

THE WORLD IS SPINNING—100!
PHONE 2-7234-5
Cable Spinning Equipment Co.
3100 TOPEKA AVE. TOPEKA, KANSAS

Look to the Leader

KLEIN

for SAFETY SNAP HOOKS



455 Solid Eye

Here's strength, safety on heavy loads—for blocks, tackles and hoists. Klein Safety Snap Hooks are time savers, too, eliminating the necessity of taping or wiring the throat. Made of drop forged steel—carry a working load of 8,000 pounds with adequate safety factor. Snap on easily with one hand—may be used on any conventional steel block 6 inches or smaller, or on chain hoists or snatch blocks. Four types regularly available. Specify 455-SH-3 Snap for use with 1½-ton hoists . . . No. 455-SP for double chain hoists and for attachment at housing. Klein can also supply safety snap hooks for lighter loads.

455-S Swivel Eye

455-SH Swivel Eye

Foreign Distributor: International Standard Electric Corp., New York

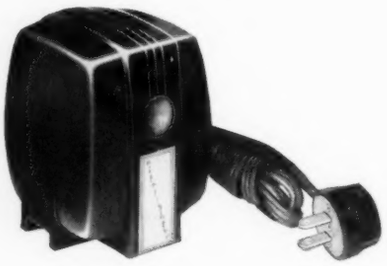
455-SP

Write for your free copy of the Klein Pocket Tool Guide today!

ASK YOUR SUPPLIER

Mathias KLEIN & Sons
Established 1857 Chicago, Ill., U.S.A.
3200 BELMONT AVE., CHICAGO 18, ILL.

The Nitelighter is mounted on the wall with its photoelectronic light-sensitive "eye" pointed toward light. The lamp to be controlled is plugged into



the Nitelighter plug fixture. The Nitelighter turns the booth light on at different times each night, depending on what time darkness comes, and it will stay on until daylight returns.

The Nitelighter is compact, and is put into operation simply by plugging the cord into any 110 volt 60 cycle outlet. An 8-foot cord set with adaptor plug and a bracket for flat surface mounting are included. Fully guaranteed, it will control lamps up to 300 watts. Request NP 311.

• • •

CABLE RIPPER AND WIRE GAUGE—An improved tool for ripping the outer covering of non-metallic sheathed cable including small type "T" has been developed by Holub Industries, Inc.

The manufacturer states that this tool (designated Hi-225) speeds wiring because it is easier to use. The cable is merely slipped in, the handles are

squeezed together, then a pull cuts the sheathing as far as desired. In the case of long ripping, there is no time lost in feeding the cable end through a narrow area because this tool is designed with an offset end by which the cable slides.

Other improvements include long handles for a good grip, cadmium plating to prevent rusting and accurately stamped holes in the handle to measure wire sizes from Nos. 14 to 6.

The ripper is made of steel with a case hardened cutting point for long life. All cutting edges are smooth, preventing cutting of fingers, the company states. Overall length is 5 inches. Request NP 312.

• • •

PRESSURIZED ANTI-OXIDANT — Preformed Line Products Co. has announced that a new anti-oxidant has

look to

LONG-BELL

FROM TREE TO TRADE

for pressure creosoted poles • southern yellow pine • douglas fir

available from
DeRIDDER, LOUISIANA
JOPLIN, MISSOURI
WEED, CALIFORNIA
LONGVIEW, WASHINGTON

The Long-Bell Lumber Company
Wood Preserving Division
Kansas City, Mo. Longview, Wash.

been packaged under pressure in an easy-to-use spray can. Since this can may be carried readily on the belt of a lineman, it is a means of assuring that an anti-oxidant is used wherever fittings are applied.

Sprayox is used for retarding oxidation and corrosion. Request NP 313.

• • •

COLOR-CODED SIX PAIR RURAL DISTRIBUTION CABLE—A new completely color-coded six pair No. 19 A.W.G. rural distribution cable with polyethylene-insulated and poly-vinyl chloride-jacketed conductors is now available from Whitney Blake Co.

According to the company, this self-supporting cable is easy to install because of its light weight, small size and complete color coding. Less trimming is required in wooded areas. It is available in long lengths, making possible long runs without splices.

Electrical characteristics of the cable include low-loss transmission, low capacitance and high dielectric strength, the company reports. The cable is weather resistant and electrically stable. Colors are permanent. The six pairs are cabled around a central member of polyethylene-covered, 1800 pounds breaking strength, galvanized steel.

The cable replaces six pairs of open wires for rural telephone distribution. It can be attached to the pole, without the need for using cross-arms or, on already-crowded poles, either to the pole or to the under side of an existing cross-arm. The cable also serves as multiple drop wire to small apartment and office buildings. Request NP 314.

• • •

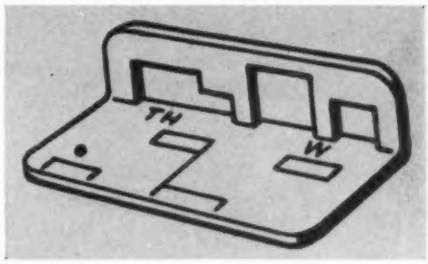
BRUSH CHIPPER—Fitchburg Engineering Corp. has just released a new illustrated booklet, "Real Brush Eaters," of interest to telephone and other companies, to line clearance supervisors and to tree service experts.

The brochure tells how brush and trimmings from clearing right-of-ways can be converted on the job to easy-to-dispose-of wood chips, saving man-hours and hauling expense, and avoiding burning hazards. Request NP 315.

• • •

GAFF GAUGE—With Mathias Klein & Sons precision gaff gauge (KG No. 1), linemen can make a quick safety check on correct gaff thickness and width.

Made of plated hardened steel, the gaff gauge is packed in a durable plastic case, complete with instructions and helpful information on sharpening

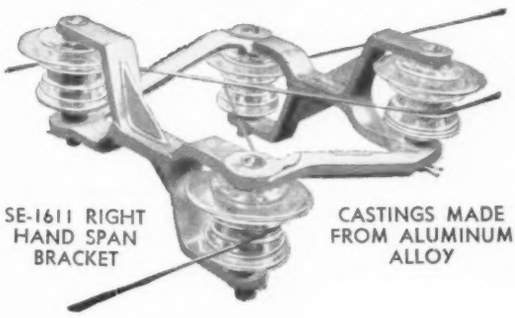


gaffs and testing for proper sharpness by the "plane test" method. Request NP 316.

• • •

CLIP-ON GAFF GUARD—Also announced by Mathias Klein & Sons is a

Get
IN CASE* YOU ~~WANT~~
A REAL MONEY SAVER!



YOU GET ECONOMY

CASE* span brackets help you save on the number of poles in new line construction and in reconstruction; long spans are possible.

YOU GET QUALITY

Fabricated from lightest of all structural metals; equipped with Hemingray glass insulators; eliminate cross talk; easy to install.

RC-1 rubber insulators for use in areas where breakage of glass insulators is known to be prevalent.

Type 1088 Hemingray glass insulators complete with rubber bushings.

SOLD BY LEADING DISTRIBUTORS IN THE UNITED STATES

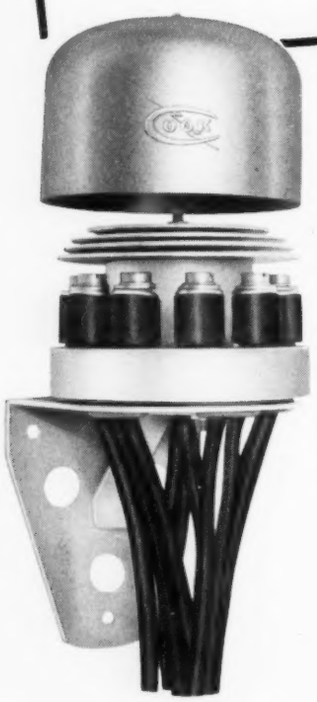
Also available
CASE ALUMINUM TRANSPOSITION POINT BRACKETS

CANADA: N. Slater & Company Ltd., Sydney St., Hamilton, Ontario
ORDER FROM YOUR DISTRIBUTOR

TRANSANDEAN ASSOCIATES, Inc.
P.O. BOX 214, ORANGE, N. J.

Consulting Engineers and Constructors

WHAT THE WELL DRESSED POLE WILL WEAR



THE NEW COOK HY-CAP 5 CIRCUIT POWER CROSS PROTECTOR

A new Hy-Cap Power Cross Protector providing a single assembly for 5 circuits to be mounted on a 10-pin arm requiring only a single ground wire. It is easy to install with only three mounting screws and five pigtail connections. Pole gaining and through bolts are eliminated. Pigtails are factory wired to the protector.

This small size unit is weather proofed with an aluminum cover and sealed with rubber grommets. It is designed to provide an extended arcing period by means of heat radiation fins and to prevent carbon breakdown by means of a light gauge self-destroying cover.

Each electrode is equipped with a fusible element which melts and further reduces the impedance of the fault current path when the power cross continues over an extended period.

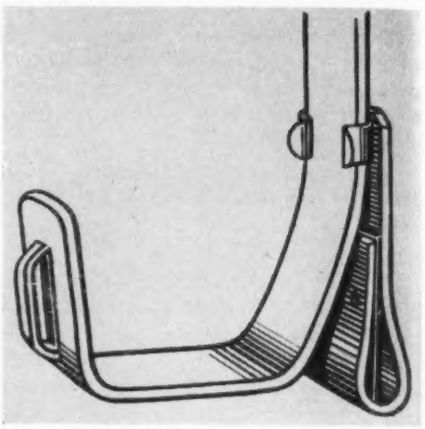
Ideal for economical joint occupancy wire installations.

THE COOK XB CABLE TERMINAL

The type XB Unprotected Cable Terminal features many important advancements in construction and high insulation characteristics, such as a patented Bakelite face plate and insulating fanning strip moulded in one piece, with sturdy Everdur studs deeply embedded and positioned for convenient wiring. It is furnished in 6, 11, 16, and 26 pair sizes.

The Cook XB cable terminal is supplied with or without a cable stub or with a compression coupling for plastic cable, as an optional feature.

SUTTLE
EQUIPMENT COMPANY
LAWRENCEVILLE ILLINOIS

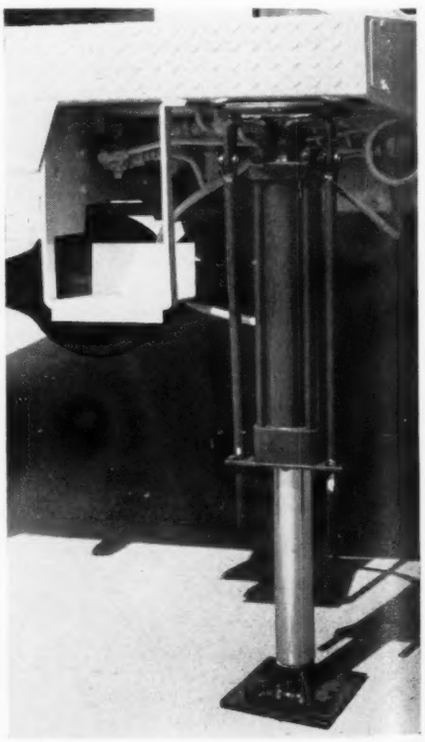


new clip-on gaff guard (1901 MG), which provides protection for the all-important spur on climbers when not in use. They also safeguard other equipment in the lineman's tool kit.

The guard is made of first-quality leather and firmly riveted. A rustproof stainless steel spring clip holds the gaff guard to the climber shank. A stop piece of rigid fiber prevents the gaff from penetrating the guard. Request NP 317.

• • •

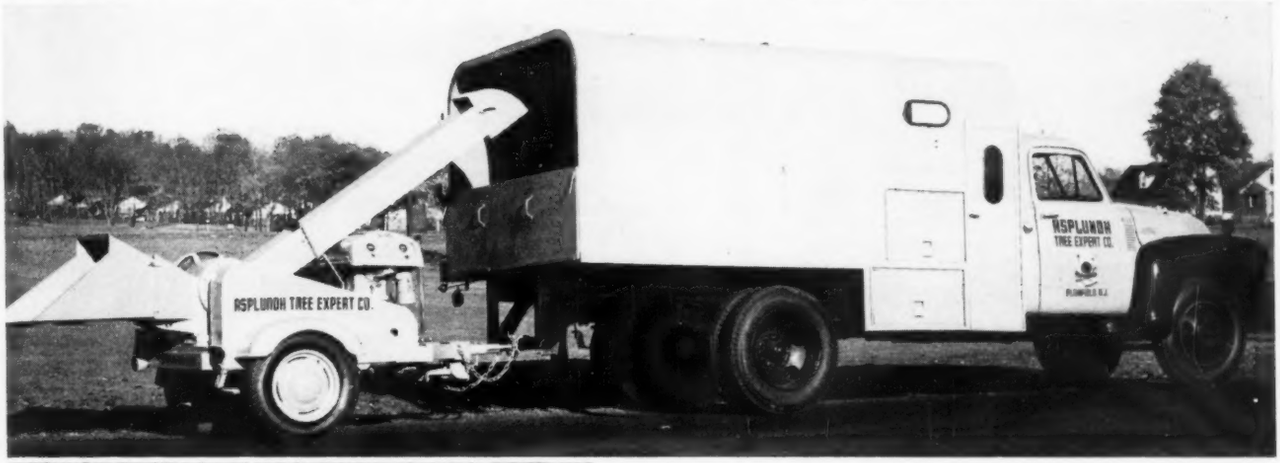
SELF-STOWING HYDRAULIC JACK—J. H. Holan Corp. announces a new 14,000-pound capacity, self-stowing hydraulic jack as optional equipment on the Holan 3700 model "HL" power-

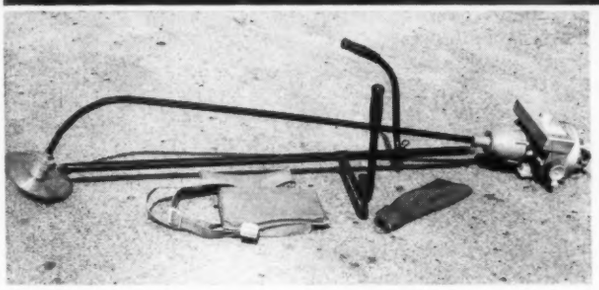


operated derrick, and for use on existing line construction units.

Known as the Holan model 4095 self-stowing hydraulic support jack, the product is designed for completely automatic use. It is operated by a con-

HOW TO SOLVE YOUR BRUSH PROBLEMS





THREE INVESTMENTS WHICH PAY DIVIDENDS

Asplundh CHIPPERS are available in three sizes as self-contained Trailers or for Trucks or Tractors.

Asplundh TRUCK BODIES are complete with personnel compartments and space for all tools and chips.

Asplundh BRUSH SAWS, with flush-cutting 30° angle head, are rugged, efficient and low in cost.

HIGHLAND AVE. AT YORK ROAD **JENKINTOWN, PENNA.**

ASPLUNDH CHIPPER COMPANY

LENZ SWITCHBOARD CORDS

LOOK FOR

LENZ

THIS MARK OF QUALITY

BEGINNING 51 YEARS OF SERVICE

We are in our 51st year of manufacturing Cords. Wires and Cables for the Telephone Industry.

Lenz NYLON Switchboard Cords have been in continuous service for over nine years. Improve your service plus greater economy with these outstanding cords. Write today for complete information.

Make Room 553 at the Conrad Hilton Hotel your Headquarters during the U.S.I.T.A. Convention — You are most welcome.

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427 W. Randolph Street
Chicago 4, Ill.

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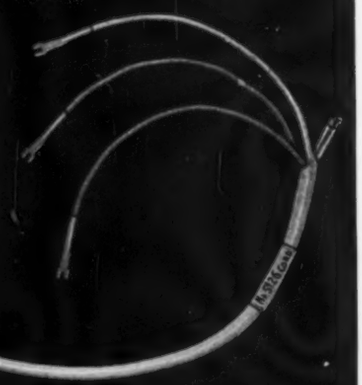


LENZ ELECTRIC MANUFACTURING CO.

1751 N. WESTERN AVE., CHICAGO 47, ILL., U. S. A.

"IN BUSINESS SINCE 1904"

Fold up your derrick from inside the cab!

with the

TEL-E-LECT STORAGE KIT

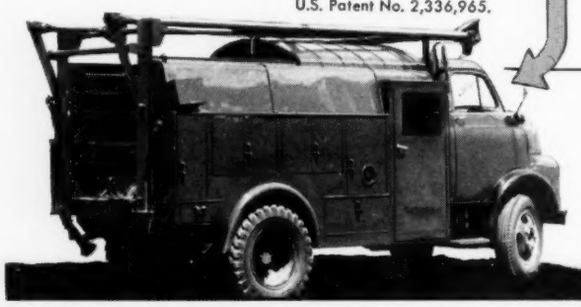
The patented Storage Kit fits any standard utility truck body and "A" frame derrick and it can be quickly bolted on the back of your truck by your local mechanic. The derrick will go up or down in a minute or less, entirely controlled by the man in the truck cab. Working with a double drum winch, you get live boom operation—or easily adjustable derrick elevation with a single drum winch. The cost is only a fraction of other, more intricate derrick storing systems—and there's no rebuilding of your present equipment! *Write for details.*

Earth Boring Equipment for All Types of Trucks

TEL-E-LECT *PRODUCTS, INC.*

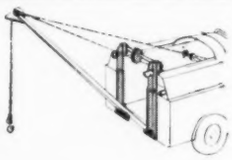
10,001 Minnetonka Blvd., Minneapolis 16, Minn.

U.S. Patent No. 2,336,965.



Derrick raised by simply engaging the winch.

Vertical position—winch rotation reversed.



Derrick is locked in operating position.

WHEN COMMUNICATION AND POWER CIRCUITS RUN TOGETHER . . . . . .

OCT-O-DUCT

Makes Duct Erection Easy

A BANK OF OCT-O-DUCT containing 9 communication and 4 power circuits was easily erected in *less than 8 hours* by a 3-man crew at the new International Airport at Los Angeles. More than 6500 feet of OCT-O-DUCT was installed in a trench approximately 500 feet long.

OCT-O-DUCT is designed to take complicated set-ups like this in stride. Flat sides, simple couplings and convenient length make it first choice with contractors and construction departments in telephone and power utilities throughout the West. OCT-O-DUCT's low first cost and low installation cost, combined with its outstanding electrical, chemical and mechanical characteristics, give you your best buy in underground circuit protection.

WRITE FOR NEW BULLETIN 54 A, which gives detailed specifications. Also for the OCT-O-DUCT *Installation Manual*, describing this product and its recommended use.

SOAPSTONE DUCT COMPANY

110 Linfield Drive, Menlo Park, California

trol lever located near the derrick controls. This enables one man both to position the hydraulic jack and erect the derrick in a few seconds time, the company states.

This new self-stowing jack also is said to enable the operator to level the rear of a truck quickly, or to raise a truck for placing chains on tires or replacing wheels. The jack extracts itself from mud and dirt.

A double-acting cylinder adjusts the jack from 25 to 39⅝ inches in height, allowing sufficient travel for all operations. The jack is automatically locked in any position by means of check valves. Hydraulic power is obtained from existing hydraulic systems on Holan derrick units, and from separate hydraulic systems installed with the jacks on other line construction units. In stowed position the jack offers no road hazards, the company reports.

The Holan model 4095 self-stowing hydraulic support jack is also designed for use on Holan towers, ladders and line bodies. Kits are available for such installations. Request NP 318.

• • •

REFLECTIVE SIGNS—Gladwin Plastics, Inc., has just established a new division for the production of advertising and traffic signs. The company has announced that the first of a line of molded reflective signs carrying the

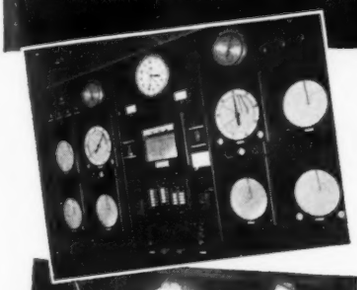
legend "TELEPHONE AHEAD" and clearly visible at night as far ahead as automobile headlight beams can reach, is now available.

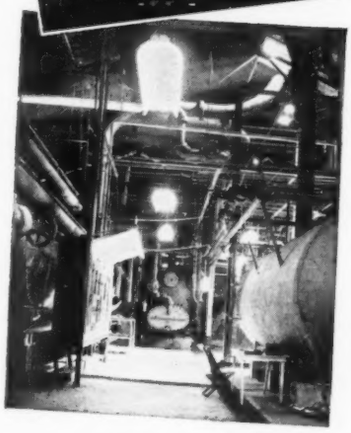
Boasting certain advantages over those made of aluminum and steel, the new Gladwin signs are made from a combination of polyester resins and Fiberglas. A new process known as molded color separation is used.

In this process there is actual penetration of the color used for the copy or illustration below the surface of the background color. At the same time, the copy or illustration color and the background color are bonded together by cohesion.

The polyester used may be made to

PRECISE CONTROLS ASSURE LONG LIFE TO TAYLOR-COLQUITT POLES



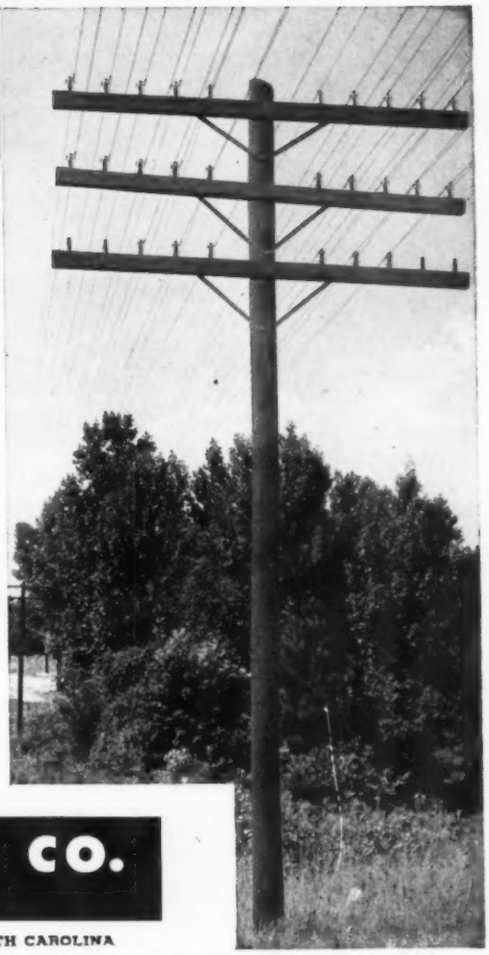


From the pine forests of the Southeast to the outbound loaded car, each step in Taylor-Colquitt pole production is subject to precise and accurate control.

These controls cover timber selection and pole manufacture as well as moisture removal and preservative treatment. Developed and refined during the 27 years that Taylor-Colquitt has been a producer of fine poles, they assure uniform high quality and consequent maximum life.

For poles in which nothing has been left to chance, specify Taylor-Colquitt treated pine.

Taylor-Colquitt poles are distributed to independent telephone companies exclusively by Automatic Electric Sales Corporation, 1033 West Van Buren Street, Chicago 7, Illinois.



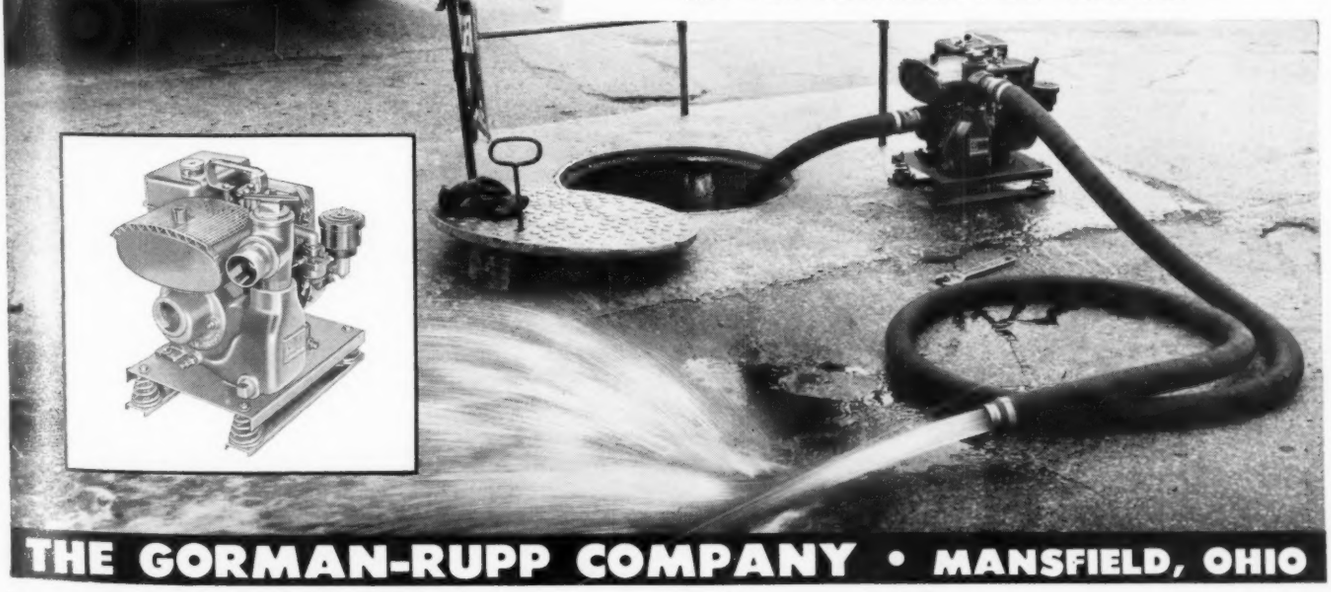
TAYLOR-COLQUITT CO.
SPARTANBURG, SOUTH CAROLINA

PLANTS AT SPARTANBURG, SOUTH CAROLINA AND WILMINGTON, NORTH CAROLINA

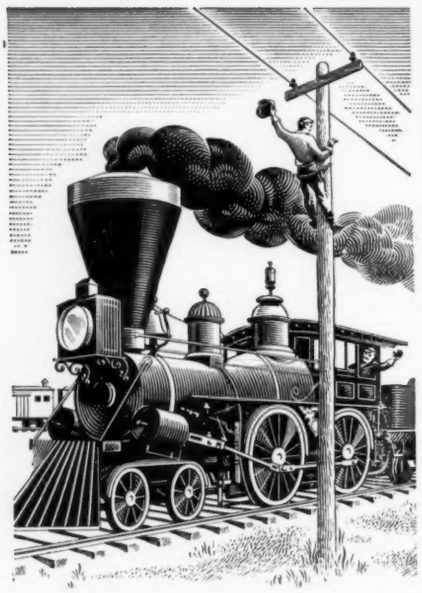
GORMAN-RUPP PUMPS
Designed for Telephone Companies
QUIET — STURDY — EFFICIENT

Especially for **quiet** zones — ideal for residential areas. Equipped with quiet accessories, including muffler and hand throttle.

ASK FOR TELEPHONE PUMP BULLETIN



THE GORMAN-RUPP COMPANY • MANSFIELD, OHIO



"Faster Freight"

In 1851, Erie Railroad became the first railroad to use telegraphic communications in dispatching trains. This method eliminated many hours of delay at passing points in the single track railroading of that day. Its success led to adoption of the telephone system for dispatching trains now in general railroad practice.

It was in this same era that the first Hemingray Glass insulators were made. Through constant research and development they have kept pace with the communication industries of the world.

There is an insulator design suitable for every communication pole-line requirement. Most jobbers carry complete stocks. Write for a free descriptive catalog. Kimble Glass Company, subsidiary of Owens-Illinois

HEMINGRAY INSULATORS

AN (I) PRODUCT

OWENS-ILLINOIS

GENERAL OFFICES · TOLEDO 1, OHIO

meet certain specific requirements fitted to the particular end use of the sign. That is, it may be produced with various qualities of hardness, toughness, rigidity, flexibility, freedom from heat distortion and light stability.

The net result, the company says, is a sign panel which will not rust or corrode, will not dent or warp and which has exceptional strength. Since the color is impregnated throughout the plastic, it never needs repainting.

In addition to durability, the signs also are lighter in weight than those similar in size and made of metal.

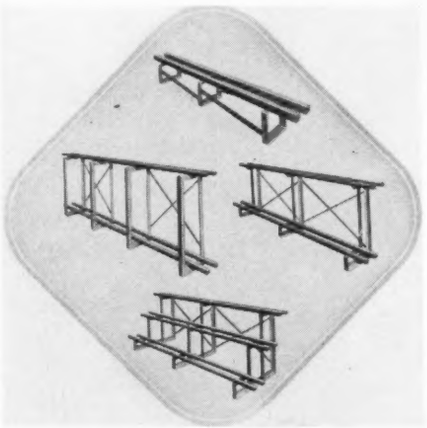
The plastic signs are made with a special beading that makes them highly reflective for use in places where the message they carry needs to be picked up at night by automobile headlights.

The "TELEPHONE AHEAD" sign (24 inches x 39 inches) is available by itself with an aluminum edging or as part of a kit. The kit would contain the sign, two uprights and two cross pieces of angle iron which would make up a frame suitable for display on roadsides. The uprights would be available in 8, 10 or 12-foot lengths.

Other signs now in the design stage will be released to the industry soon. Request NP 319.

• • •

STEEL BATTERY RACKS—Suitable for all makes of storage batteries, in all applications where emergency power is needed, the new and redesigned line of

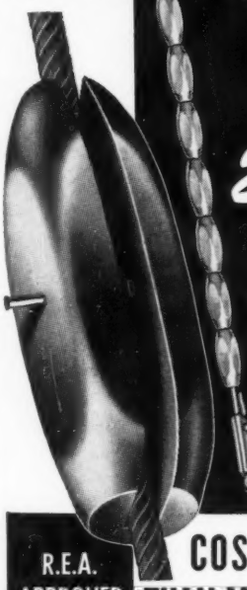


steel battery racks offered by The Electric Storage Battery Co., incorporates the company's latest engineering thinking and certain innovations suggested by customers.

The racks are fabricated from structural steel with double-braced frame uprights and welded joints throughout, giving them certain strength advantages over other battery racks on the market, according to the company. Rail deflection under the heaviest battery load, even with rack lengths of 15 feet, is less than ⅛ inch.

All structural members are protected

Eliminate
GUY GUARD TROUBLES
this easy
Flexibal
way



1 SLIP OVER WIRE
2 DRIVE HOME NAIL
3 ATTACH CLAMP
"the Economical Guard that can't go wrong"

R.E.A. APPROVED
COSTS 1/3 LESS THAN METAL GUARDS
AND
NO MAINTENANCE PROBLEM

FLEXIBAL Guy Guards provide the flexibility that yields with the blow and cushions the impact. Made of hardwood, aluminum-painted, they increase the day and night visibility. Easiest guard to handle, simplest and quickest to install—by all odds safest in use, with a proven record of greatly reduced losses. Specify it for better appearance, greater convenience, and major savings.

Used and Praised by Constantly Growing List of Utilities
Write for Free Sample and Prices

IMMEDIATE DELIVERY

TEN COMPLETE SETS IN THIS ONE LIGHT EASY TO HANDLE CARTON

SEE YOUR JOBBER OR WRITE TO
S. E. OVERTON COMPANY
SOUTH HAVEN, MICHIGAN

with two coats of long-wearing, acid-resistant gray paint. Cell pads are replaced by a cushioning plastic sleeve which also eliminates the need for repainting top rails. The plastic channel was selected by Exide engineers for its insulating and wearing qualities, and has a tested dielectric strength of 5,000 volts. Possibility of grounds is virtually eliminated even with wet battery cases, and batteries are insulated at all times, according to the company.

Four basic designs are available: single row, one-tier; single row, two-tier; two-step and three-step. Earthquake protection equipment is available. Racks are shipped knocked down with complete directions for assembly and installation. Vibration-proof self-locking nuts are used throughout. Request NP 320.

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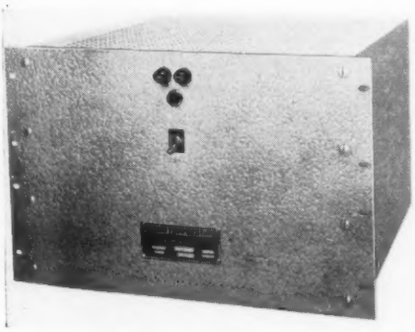
AC LINE VOLTAGE REGULATOR—The Power Equipment Co. recently introduced a new group of ac line voltage regulators.

The company designed and developed this new regulator for its own use,



and after field-testing it, now offers this new group of equipment as separate items in five popular ratings.

Power Equipment Co. says this new regulator is exceptionally small in size and weight, a fact accounted for by the efficiency of the power circuit. The self-saturating circuit was designed for a very low output impedance which permits transient overloading without undue loss of regulation.

The control section is basically a magnetic amplifier with a cold cathode-type tube used as a voltage reference. In spite of this tube's dependability, conservative engineering dictates that an alternate tube be kept ready as a standby. Test switches permit routine checks of both tubes to make certain they are operable.

According to the company, safety factors are designed into the iron core components of this group of regulators in order to approach trouble-free operation. Request NP 321.

• • •

STANDARD SIZE POWER SUPPLIES—Having developed a self-saturating

Meet The Suttle Gang*
in
Rooms 519-529
National Convention

*Representing and Presenting These Famous Quality Products:

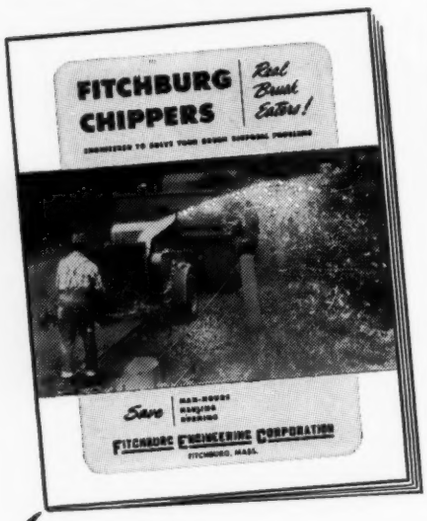
Ankoseal Plastic Covered Cable
Autelco Pay Stations
Leich Handset Telephones
Keystone Super Steel Line Wire
Copperweld Wires and Products
Alphaduct Insulated Wires
Cook Protection and Apparatus
Runzel Cords of All Kinds
TFA Plastic Insulated Plugs
Churchill Booths—Calculagraph
Burgess Manning Booths
American Cross Arms
Joslyn Hardware and Poles
Sub-Cycle—Electrox—Nicopress
Reliable Electric Products
Gray Labels—Dutch Brand Tape
Suttle Ready Wire Reels
and Many Others.

P.S. We'll be happy to see you. And be sure to register for the door prizes we have this year!

Suttle Equipment Co.
Serving The Independent Telephone Men Since 1910
LAWRENCEVILLE ..... ILLINOIS

Save-

MAN HOURS
HAULING
BURNING



New, FREE BOOKLET
tells about
LOW-COST BRUSH DISPOSAL

Read how leading tree surgeons, power companies, municipalities, utilities use Fitchburg Chippers to cut disposal costs up to 50%—create customer good will.

Whatever your brush disposal problem, you will more than likely find the answer right in this new booklet, packed with valuable facts, specifications, and suggestions.

Learn how a Fitchburg Chipper can increase the efficiency of your operation. Mail the coupon for your Fitchburg Chipper booklet today.

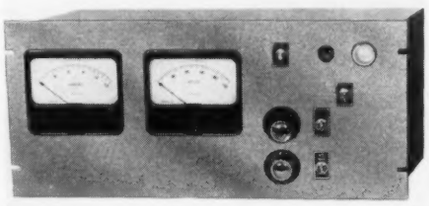
TEAR OFF and MAIL

FITCHBURG ENGINEERING CORPORATION
Dept. 179, Fitchburg, Massachusetts
Send me the New Chipper Booklet!

*Name*_____
*Address*_____
*City*_____
*State*_____

open bridge circuit, Power Equipment Co. offers a group of power supplies that are listed as standard sizes and are designed for heavier power requirements.

Designed as a result of definite requirements, where simple, inexpensive power supplies were needed, a new



voltage regulating circuit has been produced by company engineers. This circuit corrects for fluctuations of the ac input line voltage as well as variations in the dc load, and is not dependent upon the accurate maintenance of the ac line frequency. As a result, the company states this new series can be used with emergency, portable or standby power units as well as on utility lines.

The circuit is of the self-saturating type and uses an open bridge or magnetic amplifier bridge selenium rectifier in most sizes. The use of a VR-105 voltage regulating tube as a reference assures dependability. However, the company cautions, conservative engineering calls for another VR-105 as a standby.

The transition from one to another is not accompanied by any rise in output voltage, with the possible exception of a slight level change due to varying tube characteristics, nor is there any interruption in the dc output circuit, the company states. Request NP 322.

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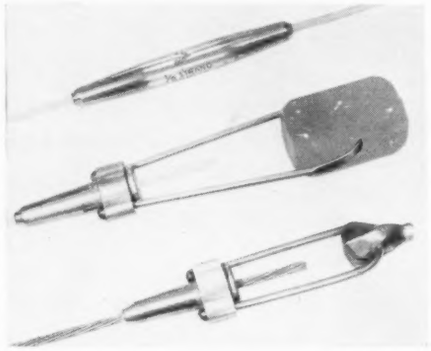
STRANDLINKS AND STRANDVISES FOR 7/16-INCH STRAND—Standlink and Strandvise for splicing and deadending steel strand messenger, static



and guy wires are now manufactured for 7/16-inch strand. Previously, these Reliable Electric Co. items were available only for ¼-inch, 5/16-inch and ⅜-inch strand.

The design feature of both the

HOW TO GIVE YOUR SALES A LIFT

Now that the age of aggressive selling has returned to the telephone business, short cuts to more sales will certainly help you.

AND THAT IS WHERE TELEPHONE ADVERTISING INSTITUTE CAN SERVE YOU WELL. Acting under the supervision of the USITA Advertising Committee, we are gearing much of our material toward building sales. This includes LONG DISTANCE PROMOTION — EXTENSION PROMOTION — CLASSIFIED ADVERTISING and will go on to include other special services as well.

This accent on promotion will be seen in the colorful Telephone Advertising Institute Posters-Booth and Counter Cards, Bill Inserts, Newspaper Mats and other material.

Naturally the basic problem of EARNINGS, SERVICE and RATES are also covered in our service.

And we offer you the tie-in mats and bill inserts for the USITA NATIONAL ADVERTISING CAMPAIGN.

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Strandlink and Strandvise is the gripping chuck which is housed in a heat-treated aluminum alloy tube. These chucks have several hundred case-hardened plated steel teeth, per set. The bails of the Strandvise are type 304 stainless steel. Holding power is said by the company to surpass the ultimate strength of standard steel strand, irrespective of grade. Request NP 323.

• • •

LARGE CAPACITY GAS CYLINDER —The Insto-Gas Corp. announces a new large capacity, portable cylinder — the "35."

The "35" cylinder was designed to meet demand for longer burning time for cylinder-mounted "Salamanders," "Jumbo Furnaces" and large torches.

The new "35" also may be used for operating two pieces of equipment at the same time. This arrangement represents a saving to users where a dual hook-up is necessary or practical, the company states.

The design of the new "35" provides a wide base with curled footring for maximum stability. Because the "35" is made of high tensile steel the tare weight is only 35 pounds, making a total weight when filled of 70 pounds —about 25 per cent lighter than other large cylinders of similar capacity, according to the company.

Insto-Gas now offers portable heat in three sizes, the new 35-pound, the 18-pound and the 5-pound capacities. Request NP 324.

V V

"Our enemies in the world denounce profits as evil. Yet the profit system is at the heart of all that we are, all that we have. Our good fortune in America can be traced to our fertile soil, our deep mines, the discoveries of our scientists, and the quick minds of our inventors. But it also has to be traced to something more, and that is the factor the Romans called '*profectus*,' meaning to progress, to profit. That's right, profit and progress come from the same root word. They grow from one seed, the seed that grows into jobs, homes, food, and happiness for all of us. So let us tell the profit-system story, and tell it with all the fidelity and all the integrity we can command." —WAYNE A. JOHNSTON, *president, Illinois Central Railroad.*

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Coaxial transmission lines with the exclusive "AIR-TITE" couplings, or with RETMA flanges. Efficient and inexpensive, there is a wide range of PRODELIN transmission lines for all requirements.

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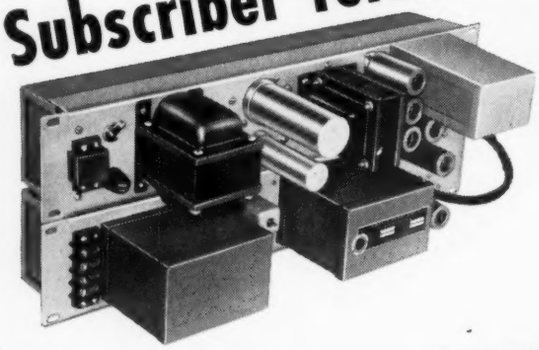

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Citizens Company Awards College Scholarship

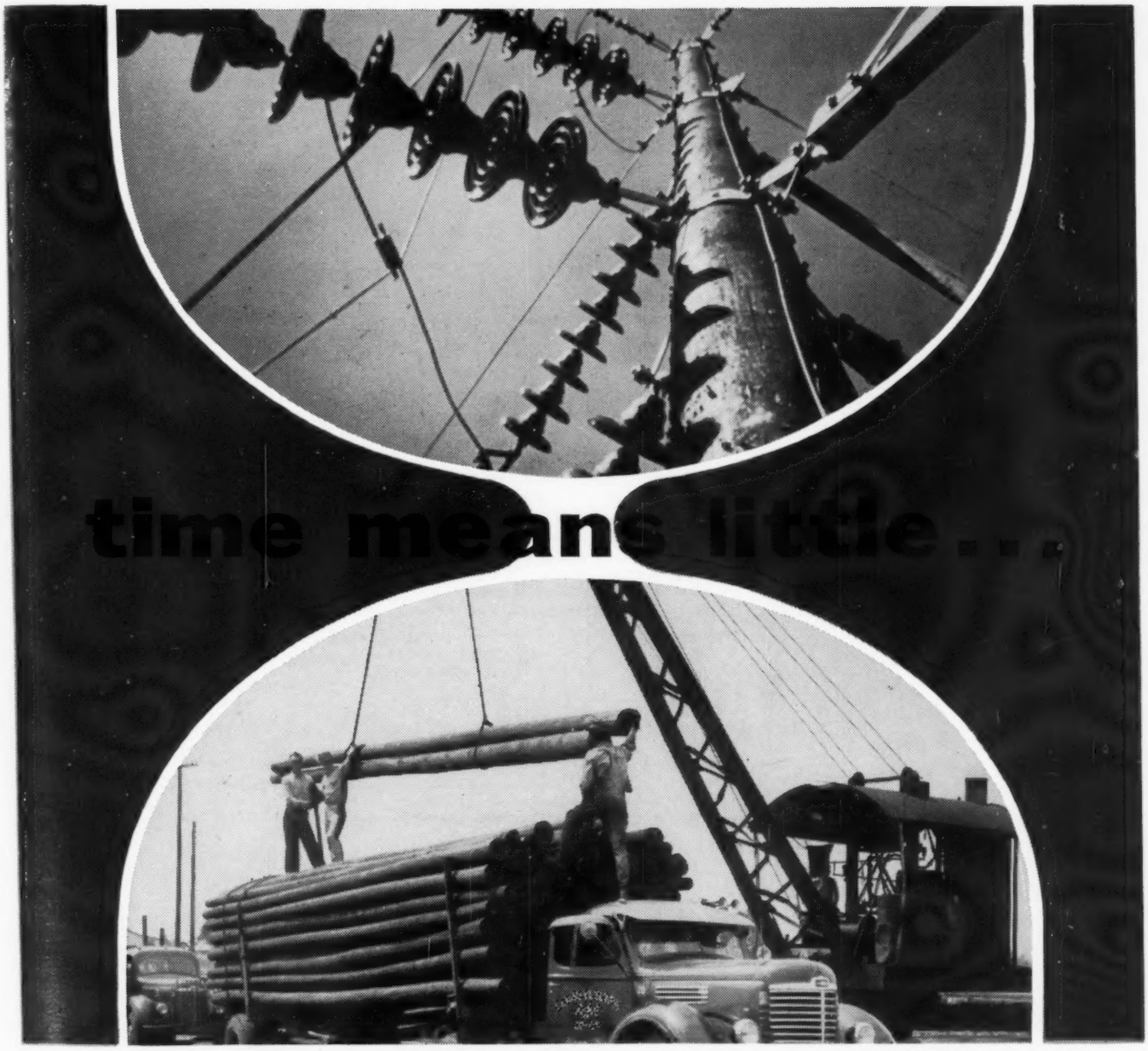
Edward E. Welsh of Greenville, Cal., recently received the first of the "Citizens Utilities—Joseph E. Briggs Memorial Scholarship" awards in the amount of $500. Presentation was made by David H. Steele, general manager, telephone, Citizens Utilities Co. of California, Redding.

The Citizens company provides telephone service at Greenville; and Edward's father, Harry Welsh, is in charge of Citizens' telephone operations at Greenville.

EDWARD E. WELSH (left) of Greenville, Cal., receiving the first annual "Citizens Utilities-Joseph E. Briggs Memorial Scholarship" for college, an award of $500. Presentation was made by DAVID H. STEELE, general manager-telephone, Citizens Utilities Co. of California, Redding.

The award is the first in an annual program recently established by Citizens Utilities Co. as part of a program of financial assistance to high school graduates desiring to pursue education at higher levels. The scholarship award culminates a nationwide competition among children, grandchildren, brothers and sisters of employes of Citizens Utilities Co. Citizens operates electric, gas, water and telephone properties serving more than 200 communities in seven states: Arizona, California, Colorado, Idaho, Maine, Vermont and Washington.

The scholarship was established as a memorial for the former administrative vice president of the company who met an untimely death in an automobile accident in November, 1951. An award will be made each year in the amount of $500. It results from voluntary contributions of more than 25 employes associated with the company and a contribution by the company. The award is made on the basis of scholastic record, recommendations of



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school authorities and community leaders and a brief competitive examination given all applicants.

In addition Citizens Utilities Co. will make summer employment available to Mr. Welsh at the end of his first year at college. This on-job experience will supplement academic training and will help scholarship students finance the cost of their subsequent years' education.

In announcing the program, Richard L. Rosenthal, president of Citizens Utilities Co., stated:

"This program has been designed to assist those children of our Citizens Utilities' family whose secondary school records demonstrate that they deserve and can utilize the benefits of higher education. . . . The award is part of our effort to make a continuing contribution to the American tradition: Opportunity for ability and reward for endeavor — regardless of origin or creed."

Edward E. Welsh, the scholarship recipient, intends to study electronics and radio engineering at California State Polytechnic College.

V V

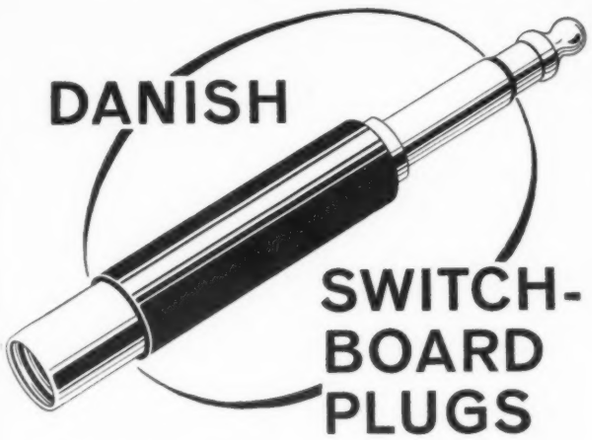
AT&T OK's Employe Stock Plan, Will Call Debentures

Directors of the American Telephone & Telegraph Co. on Sept. 16 voted to make another stock offering to Bell System employes under an employes' stock plan approved by the shareowners in 1950. About one-half of the 3 million shares authorized under the plan at that time remain to be offered now. Installment payments currently being made by some 210,000 Bell System employes under the initial offering of June, 1952, will be completed not later than February next year.

The company plans to send a prospectus describing the new offer to employes late in October. They will have until Dec. 15 to make their purchase election.

The provisions of the new offer are essentially the same as in the previous stock offering. Employes with three months or more service on Oct. 10 will be eligible to participate. No officer of AT&T will be eligible. The purchase price will be $20 per share less than the market price when payment is completed, but not more than $150 nor less than $100 per share.

Eligible employes may elect to purchase one share of stock for each full $500 of their annual basic rate of pay on Oct. 10, 1954, but not more than a total of 50 shares including any shares purchased or being paid for under the 1952 offer. If employe elections ex-



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ceed the total shares available under the plan, the company will allot fewer shares than specified in purchase elections.

Proceeds from the sale of the stock under the new offer will be used for additions and improvements to Bell System service.

The company also announced that as of Sept. 17 it will proceed with the call for redemption on Dec. 15, 1954, of all the then-outstanding debentures of two convertible issues. The twelve-year 3⅜ per cent convertible debentures due Mar. 19, 1963, will be called at 106.25 per cent of the principal amount; the twelve-year 3½ per cent convertible debentures due July 31, 1964, will be called at 107 per cent of the principal amount. Accrued interest will be paid to the Dec. 15, 1954, redemption date.

The debentures will be redeemed at the office of the treasurer of the company.

Holders of the debentures may convert them into shares of the company's capital stock until the close of business on Dec. 15, 1954. On that date, the company points out, the right to convert these convertible debentures into shares of stock will expire and interest thereon will cease to accrue.

The 3⅜'s of 1963 are convertible at a price of $138 per share and the 3½'s of 1964 at a price of $136 per share, in each case by surrender of $100 principal amount of debentures with all unmatured coupons and the balance of the price in cash. Adjustment of interest and dividends is made at the time of conversion.

V V

General of California Names Eastern Division Manager

The appointment of Otis Campbell to eastern division manager for General Telephone Co. of California, Santa Monica, was announced by Edwin M. Blakeslee, president of the company.

Former plant superintendent in the eastern division, Mr. Campbell assumed

OTIS CAMPBELL

his new post in September to replace G. H. Briggs who has been promoted to a new staff position with General Telephone Corp. in New York—the parent company of General of California.

Mr. Campbell, whose duties will be performed in the Pomona, Covina, Ontario and San Bernardino exchanges, which comprise the company's eastern division, has a background of more than 26 years of telephone experience. He began his telephone career in 1928 with the Pomona Valley Telephone & Telegraph Union which was incorporated into General's system in 1932.

V V

"It should be apparent that jobs do not spring into being by mere pronouncement, government decree, wishful thinking, or the pressing of a button. Under a free society, it is the consumer who by his preferences at the market place determines the type and amount of goods to be produced."—Excerpt from the New England Letter, published by the First National Bank of Boston.

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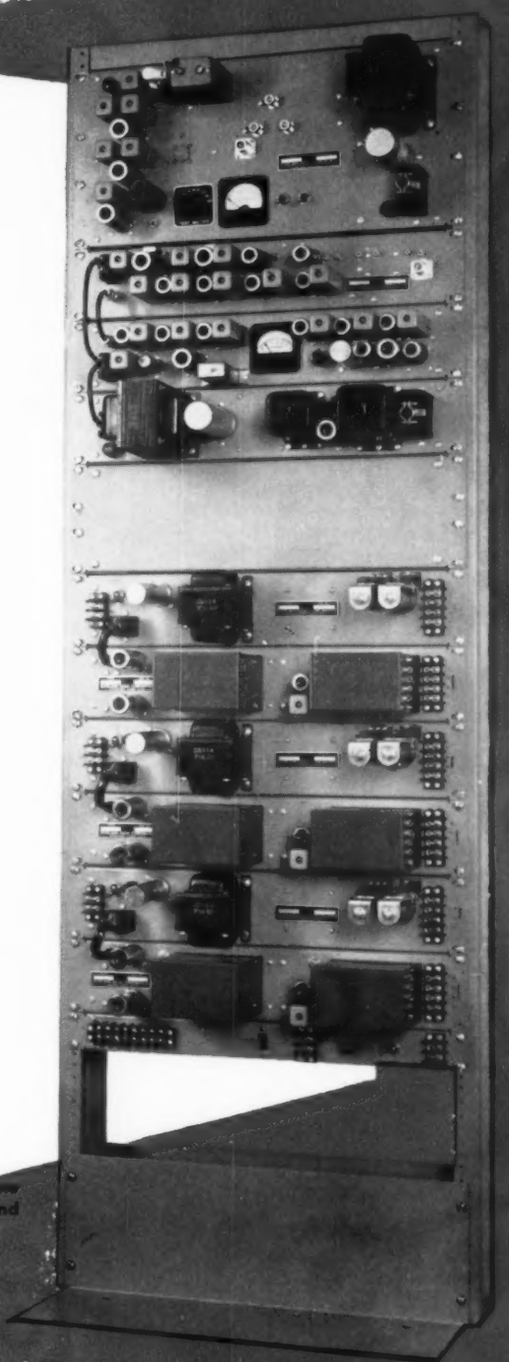

Typical Terminal Arrangement showing one Type 14 Microwave Transmitter-Receiver and three Type 16A carrier channels.

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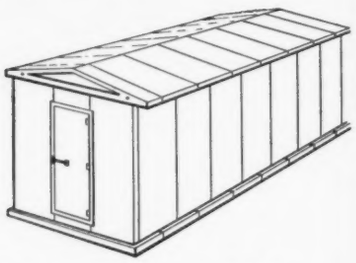

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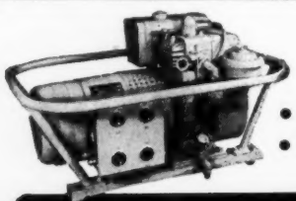

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Executives of Buckeye Telephone & Supply Co., shown inspecting North Electric's new subscriber carrier equipment, for which they will act as distributor, are (left to right): E. A. CAMPBELL, sales representative; ROBERT T. SNYDER, secretary; C. A. GILLESPIE, sales representative; R. MUEHLEMEYER, sales representative; W. C. SNYDER, vice president; R. L. HEPNER, sales manager, and E. T. TIPPETT, sales representative.

Buckeye to Distribute North Carrier and Telephones

The North Electric Mfg. Co., Galion, O., announces the appointment of Buckeye Telephone & Supply Co., 1250 Kinnear Rd., Columbus, O., as an additional distributor for the new North carrier systems and telephone instruments.

Buckeye Telephone & Supply Co., national telephone equipment distributor since 1921, will promote the new North products by means of intensive national direct mail campaigns.

This special promotion is part of a North expansion program aimed at making their new subscriber carrier available to all companies faced with the problem of adding new subscribers on loops now filled to capacity—without expensive outside construction—and the new North telephone available to all Independent companies.

V V

RCA Names 8 to Sales Posts In Communications

Appointments of E. J. Hart, as microwave equipment sales manager; D. C. Bright, as administrator of communications national accounts; and H. G. Boyle, as communications field sales manager, have been announced by the engineering products division of the Radio Corp. of America.

At the same time, RCA announced the appointment of five district sales managers for communications equipment, both microwave and mobile two-way radios. They are: Bernard Gest, central region; K. R. McHenry, southwestern region; D. B. McKey, southern region; D. L. Pearlston, eastern region; and D. O. Reinert northeastern region.

Continuing as district sales managers in other regions are: S. J. Combs, western region; F. C. Gusler, west central region; and C. K. Sulger, east central region.

Mr. Hart joined the company in January, 1953, as microwave sales coordinator, and prior to that engaged for seven years in sales engineering in the electronics field.

Mr. Bright has been with RCA since the fall of 1950, when he entered the company's government equipment organization as a contract administrator. He was previously an engineer in the business machines field.

Mr. Boyle joined RCA's sales organization in the fall of 1948, and was appointed district manager of communications sales in the eastern and northeastern region in the summer of 1952.

V V

Stromberg-Carlson Announces Two Appointments

Raymond J. Wentis will assume new duties as telephone sales representative working out of the Chicago office, according to T. C. Thompson, sales manager of the Stromberg-Carlson Co. telephone division. He will cover the state of Kentucky and parts of Indiana and Tennessee, formerly covered by Charles E. Fogg who has been transferred to the telephone engineering department in the Rochester office. Mr. Fogg has been advised to discontinue traveling for the present time due to

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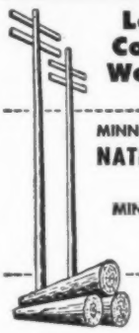

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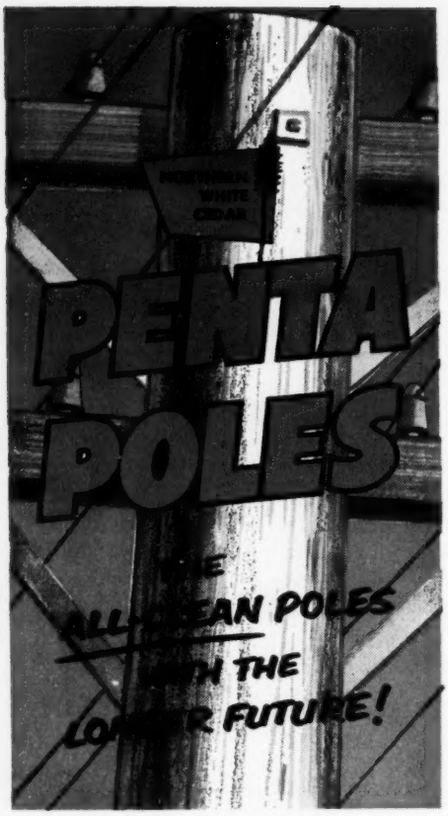

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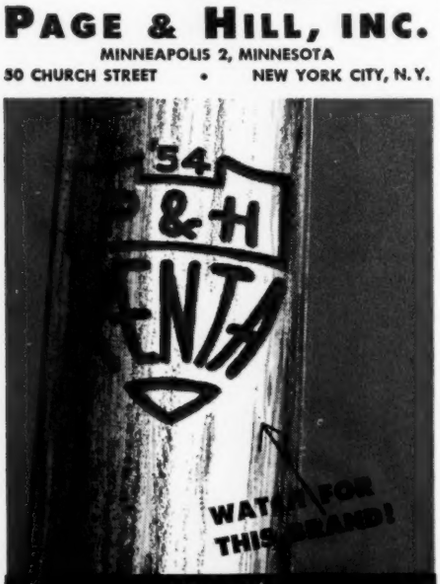

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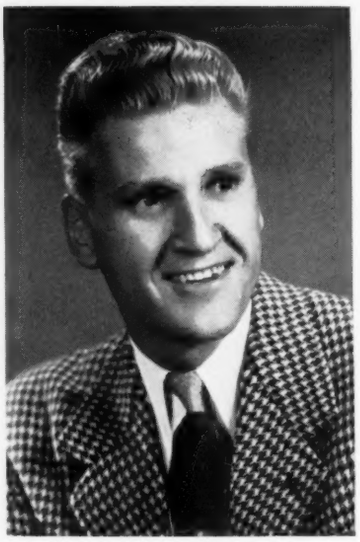

R. J. WENTIS

a back injury received during an automobile accident.

Mr. Wentis was born in Rochester and his education in his home town included study at the Rochester Business Institute. He joined Stromberg-Carlson in 1941 as a factory clerk. After serving in the U. S. Air Force during the war years, he returned to Stromberg and in 1952 was transferred to the telephone production control department as an order writer. A year later, he advanced to sales order editor in the telephone sales department, which position he has held until the present time.

Also, it was announced by Frederic W. Haupt, advertising manager for the telephone and sound divisions, that Richard F. Crandall has been appointed a technical writer for the telephone division of the Stromberg-Carlson company. He will join the group of three other technical writers whose appointments were announced in April of this year. They are engaged in writing technical manuals, instruction books and similar literature for the telephone division of the company, principally in the field of government contracts.

Mr. Crandall is a native of Asbury Park, N. J. After graduation from Asbury Park High School he entered the U. S. Army. He was stationed in Osaka, Japan, as part of the occupation forces, 25th division signal company. Upon his discharge he attended Seton Hall University, graduating with

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Ted McElroy — he ain't much use on this carrier job. He'll probably be at the Conrad Hilton as our U S I T A "Greeter".

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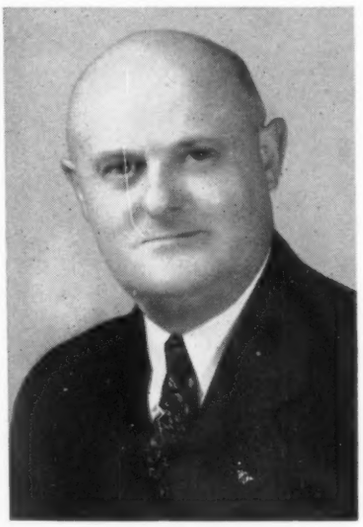
a degree in journalism. Before joining Stromberg-Carlson he was associated with the Signal Corps Publications Agency at Ft. Monmouth, N. J.

V V

Burfeind Celebrates 50 Years With Automatic Electric

Fifty years ago this month, Raymond H. Burfeind, now assistant to President H. F. Lello of Automatic Electric Sales Corp., started work for Automatic Electric Co. For the greater



R. H. BURFEIND

part of this period, he has been engaged in sales work, and since 1948 he has had special responsibilities in representing Automatic Electric at Independent telephone company conventions.

When he started with Automatic Electric, Mr. Burfeind already was a telephone man with some experience, having worked for other telephone manufacturers. After three years in patents and seven in engineering, he entered sales as district manager in charge of private automatic exchanges. In 1916, he sold the first group of unattended community automatic exchanges, and thus started a program which has resulted in wide-scale adoption of such equipment in rural exchanges throughout the country. Later he was placed in charge of central office equipment sales, and it is to this work that he has since devoted most of his time and effort with results that have been conspicuously successful.

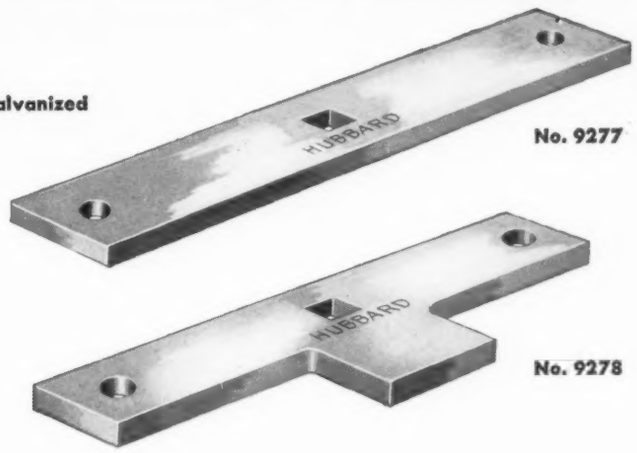
For his outstanding contributions to the art of communication, Mr. Burfeind was presented the Talbot G. Martin award by the Strowger Automatic Electric employe organization, on Dec. 10, 1942.

V V

"The only real way to increase wages for everybody is to increase production. . . ."—Pampa (Tex.) *Daily News*.

HUBBARD TANDEM TRANSPOSITION BRACKETS

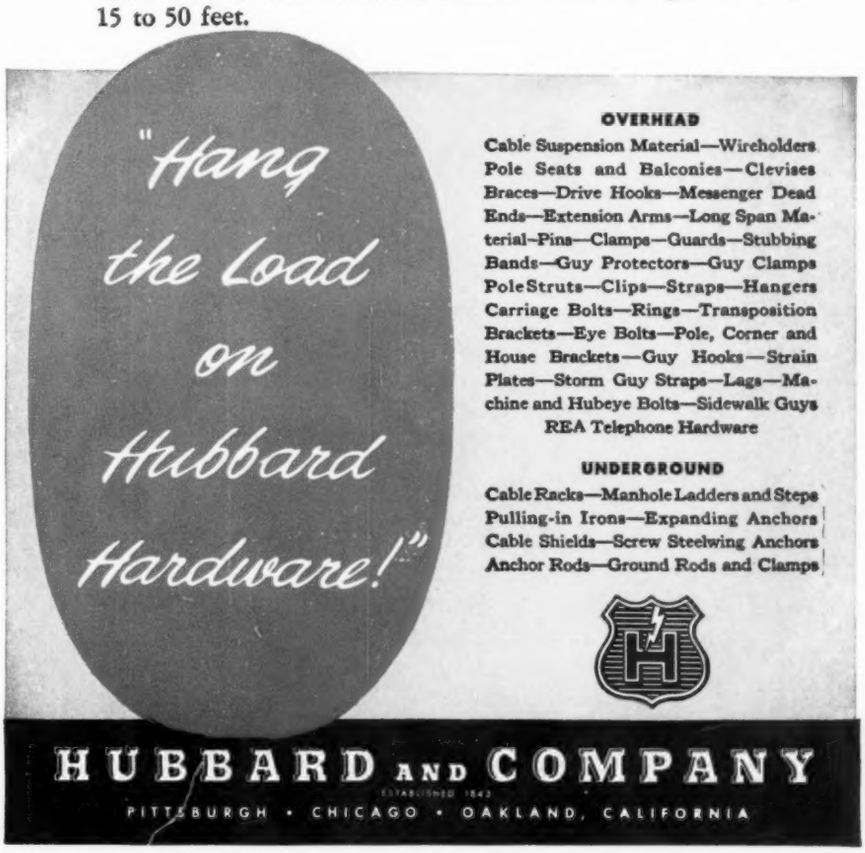
Hot Galvanized



No. 9277

No. 9278

HUBBARD Tandem Transposition Brackets are universally used by the largest telephone companies in conjunction with transposition insulators. The transposed lines are crossed on a single bracket employing two pins, and mounted above the arm. Brackets are mounted sufficiently loose to swing freely during the operation of transposing the wires, and tightened when the job is finished. Tandem Brackets are normally used in lines having a span length of 150 feet or more. No. 9277 is used on straight lines or those with a "pull" of not more than 15 feet. No. 9278 is used where the "pull' is from 15 to 50 feet.


"Hang the Load on Hubbard Hardware!"
OVERHEAD
Cable Suspension Material—Wireholders
Pole Seats and Balconies—Clevises
Braces—Drive Hooks—Messenger Dead Ends—Extension Arms—Long Span Material—Pins—Clamps—Guards—Stubbing Bands—Guy Protectors—Guy Clamps
Pole Struts—Clips—Straps—Hangers
Carriage Bolts—Rings—Transposition Brackets—Eye Bolts—Pole, Corner and House Brackets—Guy Hooks—Strain Plates—Storm Guy Straps—Lags—Machine and Hubeye Bolts—Sidewalk Guys
REA Telephone Hardware
UNDERGROUND
Cable Racks—Manhole Ladders and Steps
Pulling-in Irons—Expanding Anchors
Cable Shields—Screw Steelwing Anchors
Anchor Rods—Ground Rods and Clamps
HUBBARD AND COMPANY
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YOU GET MORE FOR YOUR MONEY

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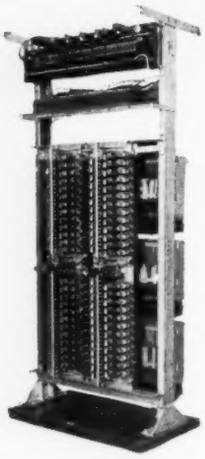
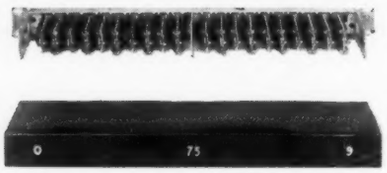


SWITCHBOARDS

Reconditioned switchboard positions of many styles and manufacture for additions to your present equipment. We can also build switchboards to specification and supply trunk plates with equipment mounted and wired for ready installation—Automatic Electric PAX connector and selector bays.



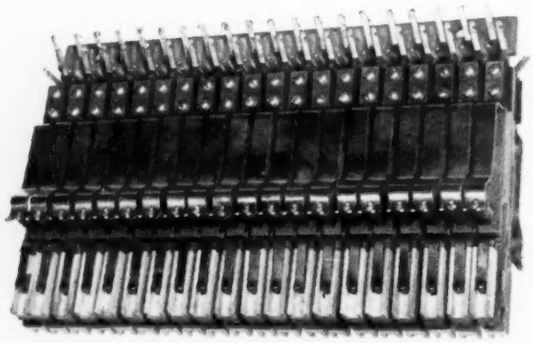
RELAYS

Line and cutoff, polarized, trip and restore trunk circuit, and cord circuit relays of the following manufacturers:

Western Electric A, B, E, U, R, 206 type
Kellogg #2000 type
Stromberg-Carlson #190, 200, 300 type
Automatic Electric

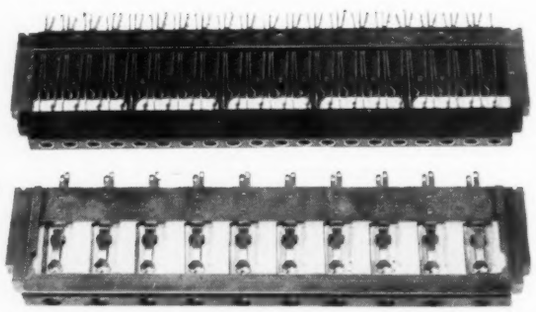
TELEPHONES

Magneto, common battery and dial telephones fully reconditioned with new cords and guaranteed.



PROTECTION AND MAINFRAMES

Many styles and types of mainframes are available or can be made up to specification (send sketch or print). Western Electric, Automatic Electric and Cook Central Office Protection complete with heat coils and carbons.



JACK AND LAMP STRIPS

Jack and lamp strips for multiple or line additions to fit many types of switchboards. Among these in stock are Kellogg, Western Electric, and Stromberg-Carlson 10 and 20 per strip.

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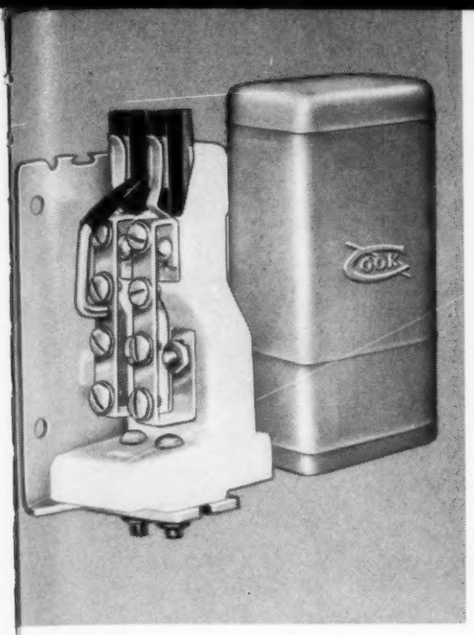

Save Drop Wire with the new Cook Party Line Junction. Ideal for terminating and protecting the cable pair drop, the cable pair, and distributing four party line drops. Porcelain base, steel mounting bracket and zinc non-corrosive cover. COOK ELECTRIC CO.

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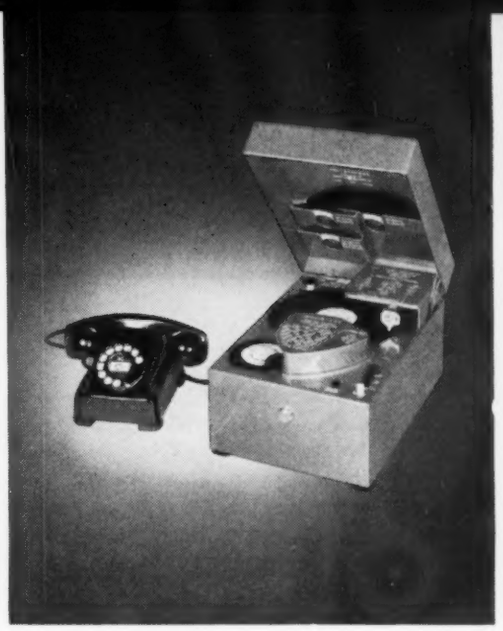

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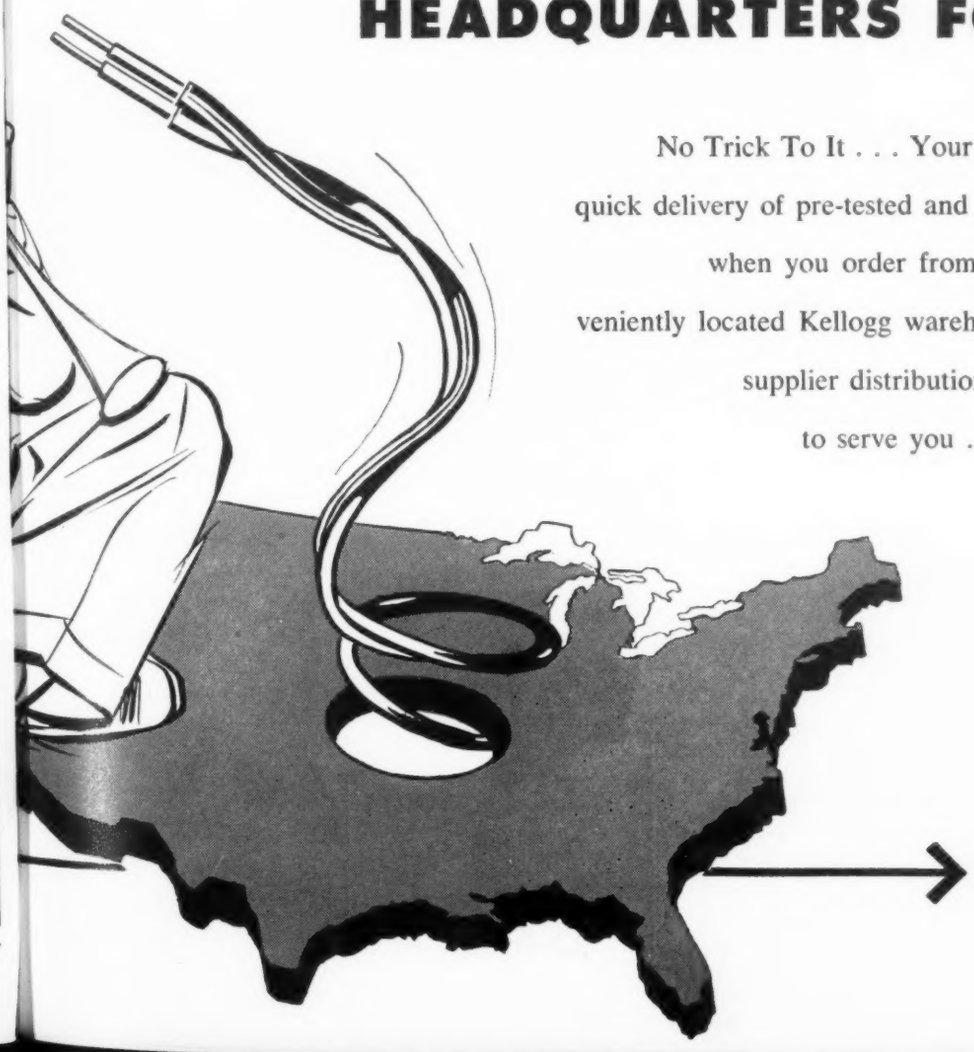

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